<110> Perera, Ranjan
      Rice, Stephen
      Eagleton, Clare

<120> Compositions and Methods for the
      Modification of Gene Expression

<130> ARBG-004/07US

<150> U.S. No. 10/291,447
<151> 2002-11-08

<150> U.S. No. 60/425,087
<151> 2002-11-08

<150> U.S. No. 10/137,036
<151> 2002-04-30

<150> U.S. No. 09/724,624
<151> 2000-11-28

<150> U.S. No. 09/598,401
<151> 2000-06-20

<150> PCT/NZ00/00018
<151> 2000-02-24

<150> U.S. No. 60/146,591
<151> 1999-07-30

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<151> 1999-03-25

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<211> 3083
<212> DNA
<213> Pinus radiata

<220>
<221> 5'UTR
<222> (1)...(2064)

<220>
<221> intron
<222> (1196)...(2033)

<220>
<221> CDS
<222> (2065)...(2751)

<220>
<221> 3'UTR
<222> (2755)...(3083)

<400> 1

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aactacatta cttcctaaat catatcaaaa ttgtataaat atatccactc aaaggagtct    180
agaagatcca cttggacaaa ttgcccatag ttggaaagat gttcaccaag tcaacaagat    240
ttatcaatgg aaaaatccat ctaccaaact tactttcaag aaaatccaag gattatagag    300
taaaaaatct atgtattatt aagtcaaaaa gaaaaccaaa gtgaacaaat attgatgtac    360
aagtttgaga ggataagaca ttggaatcgt ctaaccagga ggcggaggaa ttccctagac    420
agttaaaagt ggccggaatc ccggtaaaaa agattaaaat ttttttgtag agggagtgct    480
tgaatcatgt tttttatgat ggaaatagat tcagcaccat caaaaacatt caggacacct    540
aaaattttga agtttaacaa aaataacttg gatctacaaa aatccgtatc ggattttctc    600
taaatataac tagaattttc ataactttca aagcaactcc tcccctaacc gtaaaacttt    660
tcctacttca ccgttaatta cattccttaa gagtagataa agaaataaag taaataaaag    720
tattcacaaa ccaacaattt atttctttta tttacttaaa aaaacaaaaa gtttatttat    780
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tggttttgta ttaaaaagta atttattgtg gggtccacgc ggagttggaa tcctacagac    900
gcgctttaca tacgtctcga gaagcgtgac ggatgtgcga ccggatgacc ctgtataacc    960
caccgacaca gccagcgcac agtatacacg tgtcatttct ctattggaaa atgtcgttgt   1020
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gagtttgaa gggctttact cttaacattt gttttctttt gtaaattgtt aatggtggtt   1260
tctgtggggg aagaatcttt tgccaggtcc ttttgggttt cgcatgttta tttgggttat   1320
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tggatgaaat tcttagaaat tattattgta atttgaaact ccttcgtca ataatctgca   3060
caacacattt accaaaaaaa aaa                                           3083
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<210> 2
<211> 2064
<212> DNA
<213> Pinus radiata

<220>
<221> 5'UTR
<222> (1)...(2064)

<220>

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<221> intron
<222> (1196)...(2033)

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aactacatta cttcctaaat catatcaaaa ttgtataaat atatccactc aaaggagtct     180
agaagatcca cttggacaaa ttgcccatag ttggaaagat gttcaccaag tcaacaagat     240
ttatcaatgg aaaaatccat ctaccaaact tactttcaag aaaatccaag gattatagag     300
taaaaaatct atgtattatt aagtcaaaaa gaaaaccaaa gtgaacaaat attgatgtac     360
aagtttgaga ggataagaca ttggaatcgt ctaaccagga ggcggaggaa ttccctagac     420
agttaaaagt ggccggaatc ccggtaaaaa agattaaaat tttttgtag agggagtgct     480
tgaatcatgt tttttatgat ggaaatagat tcagcaccat caaaaacatt caggacacct     540
aaaattttga agtttaacaa aaataacttg gatctacaaa aatccgtatc ggattttctc     600
taaatataac tagaattttc ataactttca aagcaactcc tcccctaacc gtaaaacttt     660

tcctacttca ccgttaatta cattccttaa gagtagataa agaaataaag taaataaaag     720
tattcacaaa ccaacaattt atttctttta tttacttaaa aaaacaaaaa gtttatttat     780
tttacttaaa tggcataatg acatatcgga gatccctcga acgagaatct tttatctccc     840
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caccgacaca gccagcgcac agtatacacg tgtcatttct ctattggaaa atgtcgttgt    1020
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tgaattattt attccttgaa gtatctgtct aattagcttg tgatgatgtg caggtatatt    2040
cgttagtcat atttcaattt caag                                          2064
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```
<210> 3
<211> 1226
<212> DNA
<213> Pinus radiata

<220>
<221> 5'UTR
<222> (1)...(1226)

<400> 3
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tttcccacca accgttacaa tcctgaatgt tggaaaaaac taactacatt gatataaaaa     120
aactacatta cttcctaaat catatcaaaa ttgtataaat atatccactc aaaggagtct     180
agaagatcca cttggacaaa ttgcccatag ttggaaagat gttcaccaag tcaacaagat     240
ttatcaatgg aaaaatccat ctaccaaact tactttcaag aaaatccaag gattatagag     300
taaaaaatct atgtattatt aagtcaaaaa gaaaaccaaa gtgaacaaat attgatgtac     360
aagtttgaga ggataagaca ttggaatcgt ctaaccagga ggcggaggaa ttccctagac     420
agttaaaagt ggccggaatc ccggtaaaaa agattaaaat tttttgtag agggagtgct     480
tgaatcatgt tttttatgat ggaaatagat tcagcaccat caaaaacatt caggacacct     540
aaaattttga agtttaacaa aaataacttg gatctacaaa aatccgtatc.ggattttctc     600
taaatataac tagaattttc ataactttca aagcaactcc tcccctaacc gtaaaacttt     660
tcctacttca ccgttaatta cattccttaa gagtagataa agaaataaag taaataaaag     720
```

```
tattcacaaa ccaacaattt atttctttta tttacttaaa aaaacaaaaa gtttatttat      780
tttacttaaa tggcataatg acatatcgga gatccctcga acgagaatct tttatctccc      840
tggttttgta ttaaaaagta atttattgtg gggtccacgc ggagttggaa tcctacagac      900
gcgctttaca tacgtctcga gaagcgtgac ggatgtgcga ccggatgacc ctgtataacc      960
caccgacaca gccagcgcac agtatacacg tgtcatttct ctattggaaa atgtcgttgt     1020
tatccccgct ggtacgcaac caccgatggt gacaggtcgt ctgttgtcgt gtcgcgtagc     1080
gggagaaggg tctcatccaa cgctattaaa tactcgcctt caccgcgtta cttctcatct     1140
tttctcttgc gttgtataat cagtgcgata ttctcagaga gcttttcatt caaaggtata     1200
ttcgttagtc atatttcaat ttcaag                                          1226
```

<210> 4
<211> 485
<212> DNA
<213> Pinus radiata

<220>
<221> 5'UTR
<222> (1)...(431)

<220>
<221> TATA_signal
<222> (350)...(356)

<220>
<221> CAAT_signal
<222> (326)...(333)

<400> 4
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tttgtcccct gaaaattttg actaatttcc aaccaaaaaa aagtggggga aaatataaaa      120
ctctaactaa taaaacaata atcaccaaaa atctatcacc aaaaatgaaa aaagattttg      180
aatactaggc catatgagct acacaaattt caaaagtatc ttacacttat tacgcacccg      240
gatgtcccca cttтcgaaaa acccgtttca agcctttcac gaaagtccaa cggtcagaaa      300
attcaaaatg actgtttgag gcagagccaa tctaggacca cgctccattt atatatggcc      360
tctgcttctc tcgaccctta gagtcctctg ctctgcgaat cttgttgtta gttactgtgt      420
acgctgtaac aatggatgcc tatgagaagt tggagaaggt gggagaagga acctatggga      480
aggtg                                                                  485
```

<210> 5
<211> 246
<212> DNA
<213> Pinus radiata

<220>
<221> 5'UTR
<222> (1)...(167)

<220>
<221> TATA_signal
<222> (185)...(191)

<400> 5
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catccacact gttgattcat tcattatata agatcagatt cgtatgatat acaggcaacc      120
atagaaacaa ccagcaaagt tactagcagg aaatccaact aggtatcatg aagactacca      180
acgcaggctc gataatgttg gtgctcatta tttttgggtg ctgtttcatt ggggtcatag      240
ctacat                                                                 246
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<210> 6
<211> 600
<212> DNA
<213> Pinus radiata

<220>
<221> 5'UTR
<222> (1)...(167)

<220>
<221> TATA_signal
<222> (471)...(477)

<220>
<221> CAAT_signal
<222> (444)...(451)

<400> 6
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ttgtaatcta accaattcca atttccaccc tggtgtgaac tgactgacaa atgcggcccg     120
aaaacagcga atgaaatgtc tgggtgatcg gtcaaacaag cggtgggcga gagaacgcgg     180
gtgttggcct agccgggatg ggggtaggta gacggcgtat taccggcgag ttgtccgaat     240
ggagttttcg gggtaggtag taacgtagac gtcaatggaa aaagtcataa tctccgtcaa     300
aaatccaacc gctccttcac accgcagagt tggtggccac gggaccctcc acccactcac     360
tcaatcgatc gcctgccgtg gttgcccatt attcaaccat acgccacttg actcttcacc     420
aacaattcca ggccggcttt cgagacaatg tactgcacag gaaaatccaa tataaaaggc     480
cggcctccgc ttccttctca gtagcccccca gctcattcaa ttcttcccac tgcaggctac     540
atttgtcaga cacgttttcc gccattttttc gcctgtttct gcggagaatt tgatcaggtt     600
```

<210> 7
<211> 591
<212> DNA
<213> Eucalyptus grandis

<220>
<221> 5'UTR
<222> (1)...(591)

<220>
<221> TATA_signal
<222> (432)...(437)

<400> 7
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agtttggaat gtgttgtgtg tgatgtgatg gagagtatca gcattccaaa catgacatgg      60
ttttaactta tctgcaatgg tttcttttttt attcagcgaa ctcgatggct gatgctgaga     120
gaaatgaatt gggaagtcga tcgacaatgg cagctcaact caatgatcct caggtataag     180
cattttttttg gcagctctgg tcattgtgtc ttcaacttttt agatgagagc aaatcaaatt     240
gactctaata ccggttatgt gatgagtgaa tcatttgctt ttagtagctt taatttatgc     300
ccccatcttta gttgggtata aaggttcaga gtgcgaagat tacatctatt ttggttcttg     360
caggacacag ggattcatgc tagacacatc agcagtgttt ctacgttgga tagtggtatg     420
tacttagcta ctataaagga aattttgata gatatgtttg atatggtgct tgtacagatc     480
tatttaatgt caatgtatttt gaaactatct tgtctcataa ctttcttgaa gaatacaatg     540
atgagactgg gaaccctatc tggaagaata gagtggagag ctggaaggac a              591
```

<210> 8
<211> 480
<212> DNA
<213> Eucalyptus grandis

<220>
<221> 5'UTR
<222> (1)...(480)

<400> 8
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atgctgagag aaatgaattg ggaagtcgat cgacaatggc agctcaactc aatgatcctc      60
aggtataagc attttttttgg cagctctggt cattgtgtct tcaactttta gatgagagca     120
aatcaaattg actctaatac cagttatgtg atgagtgaat catttgcttt tagtagcttt     180
aatttatgcc cccatcttag ttgggtataa aggttcagag tgcgaagatt acatctattt     240
```

```
tggttcttgc aggacacagg gattcatgct agacacatca gcagtgtttc tacgttggat    300
agtggtatgt acttagctac tataaaggaa attttgatag atatgtttga tatggtgctt    360
gtacagatct atttaatgcc aatgtatttg aaactatctt gtctcataac tttcttgaag    420
aatacaatga tgagactggg aaccctatct ggaagaatag agtggagagc tggaaggaca    480
```

<210> 9
<211> 308
<212> DNA
<213> Eucalyptus grandis

<220>
<221> 5'UTR
<222> (1)...(259)

<400> 9
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gcccatctca ggtgcaacgg tttaactgat gtttactaca cgcaaggggg aggtatccgg     60
aaagcttgca aatcgggtaa aaacgaaaat gggcgacgtg gactcagcct gcccatgttt    120
tcggtctctc tcctggactt ccatgcccga taagggccgc caactctctc tctctctctc    180
tttttctctc acatctctct gcctgttcat gtcgcctgca agtgaagatt cgtcggagca    240
agaaggacga accgggcaca tggcggggtc ggcggtcgcg acggttctaa agggtctctt    300
cctggtgt                                                            308
```

<210> 10
<211> 300
<212> DNA
<213> Eucalyptus grandis

<220>
<221> 5'UTR
<222> (1)...(251)

<400> 10
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gcccatctca ggtgcaacgg tttaactgat gtttactaca cgcaaggggg aggtatccgg     60
aaagcttgca aatcgggtaa aaacgaaaat gggcgacgtg gactcagcct gcccatgttt    120
tcggtccctc tcctggactt ccatgcccga taaaggccgc caactctctc tcttttttctc   180
tcacatctct ctgcctgttc atgtcgcctg caagtgaaga ttcgtcggag caagaaggac    240
gaactgggca tatggcgggg tcggcggtcg cgacggttct aaagggtctc ttcctggtgt    300
```

<210> 11
<211> 297
<212> DNA
<213> Eucalyptus grandis

<400> 11
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gtgcaacggt ttaactgatg tttactacac gcaaggggga ggtatccgga aagcttgcaa     60
atcgggtaaa aacgaaaatg ggcgacgtgg actcagcctg cccatgtttt cggtctctct    120
cctggacttc catgcccgat aagggccgcc aactctctct ctctctctct ttttctctca    180
catctctctg cctgttcatg tcgcctgcaa gtgaagattc gtcggagcaa gaaggacgaa    240
ctgggcatat ggcggggtcg gcggtcgcga cggttctaaa gggtctcttc ctggtgt       297
```

<210> 12
<211> 661
<212> DNA
<213> Eucalyptus grandis

<400> 12
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ctgagccatt taattcgaga gcacatcgcc caaaattatt cttcttgctg ccataactgt     60
cgaattttct ctttttaggta agtaaccaat gatgcatcat gttgacaaaa aggctgatta    120
gtatgatctt ggagttgttg gtgcaaattt gcaagctgac gatggcccct cagggaaatt    180
aaggcgccaa cccagattgc aaagagcaca aagagcacga tccaaccttt ccttaacaag    240
atcatcacca gatcggccag taagggtaat attaatttaa caaatagctc ttgtaccggg    300
aactccgtat ttctctcact tccataaacc cctgattaat ttggtgggaa agcgacagcc    360
aacccacaaa aggtcagatg tcatcccacg agagagagag agagagagag agagagagag    420
```

```
agagttttct ctctatattc tggttcaccg gttggagtca atggcatgcg tgacgaatgt    480
acatattggt gtagggtcca atattttgcg ggagggttgg tgaaccgcaa agttcctata    540
tatcgaacct ccaccaccat acctcacttc aatccccacc atttatccgt tttatttcct    600
ctgctttcct ttgctcgagt ctcgcggaag agagagaaga gaggagagga gagaatgggt    660
t                                                                     661
```

<210> 13
<211> 336
<212> DNA
<213> Pinus radiata

<400> 13
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actagtgatt tgttgagaat gagtaggcat tgctacaccc atcatcacaa gcatcatcat     60
gaggagaaga agatccattt ctcactctat tactcgaact tccttcagat taggctgtgt    120
atttctcact ctaccactcc aacttccttc aaatgctgtg agttttgtt gtaattgccc     180
cgtctattta taatcgcagc agcactcgtc atataaagac ccgtgtgtgt gaacaacaac    240
caagtgattt gaattggaaa tgaagagcga gaatggcggt gtcatgaccg ggagcaacca    300
gcccgggccg tcgaccacgc gtgccctata gtaatc                              336
```

<210> 14
<211> 763
<212> DNA
<213> Pinus radiata

<400> 14
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gaagagaaga agacgatcca tttctcactc tatcactcca acttccttca gattaggctg    120
tgtatttctc actctaccac tccaactacc actccaactt attgccgcaa aagagagagg    180
ttcccaaact ctgtcggaat tctcccactc aaagcattaa aggaaagatc taattgctgc    240
aaaaaagaga gattcccaat atatttctca actcccttca aatgatttct cactctacca    300
ctccaactcc cttcaaatga tttctcactc taccactcca acttccttca aatgctgtga    360
gttttgttg taattgcccc gtctatttat aatcgcagca gcactcgtca tataaagacc    420
cgtgcgtgtg aacaacaatg gcggtgtctt gactgggagc aaccgcataa agaaagtggg    480
cttcatacat taaaaaaatc tgtaaatttt acggatttgg aaaaaggaag agcaggaggg    540

acctcccgac ttgacccgag aatggcggtg tcttgaccgc gtaaagaaag tggtcttctg    600
tacccgactt gacccgaaaa aagaggaaac gttgaacgag acaatctctg ggaacttcat    660
cgaaatgaac ctcacgactt gactctttcg attgtactgt tttcattgtt cccgcgtaaa    720
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<210> 15
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 15
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<210> 16
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 16
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<210> 17

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<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 17
tatagcggcc gcgggggggg ggggggg                                    27

<210> 18
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 18
cggagaacaa ggtggagggt agattctttc                                 30

<210> 19

<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 19
tctgcatctt gaaattgaaa tatgactaac g                               31

<210> 20
<211> 363
<212> DNA
<213> Eucalyptus grandis

<400> 20
aatcgggtga aaatagggcc gccctaaatt agaattgaca acatttcttg ggcaaagtta    60
atgtaagtta catgaaaaaa aaaaaaaagg atagtttgtt ggaagtaatg gagcatttgt   120
attgtgaaat tcacgataga gctaacaaaa ataaaggtag ttggtgggtt aacccagtta   180
aaaaagaaca ataatttgaa gagaggagag agagagagag gaggggggaga gcatttcgat   240
aaattcacta gaaaaaatgc gtgtttttagt ataaatgaga gtggaaatag ggccatctag   300
ggaacgatcg atcgcccctg cacccggcca tctggagagt ctgtttatac ttctctccgg   360
ctt                                                              363

<210> 21
<211> 839
<212> DNA
<213> Pinus radiata

<220>
<221> misc_feature
<222> (1)...(839)
<223> n = A,T,C or G

<400> 21
gtatggagtt ttgaagggct ttactcttaa catttgtttt tctttgtaaa ttgttaatgg    60
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gttattttc tcgactatgg ctgacattac tagggctttc gtgctttcat ctgtgttttc   180
ttcccttaat aggtctgtct ctctggaata tttaattttc gtatgtaagt tatgagtagt   240
cgctgtttgt aataggctct tgtctgtaaa ggtttcagca ggtgtttgcg ttttattgcg   300
```
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```
tcatgtgttt cagaaggcct ttgcagatta ttgcgttgta ctttaatatt ttgtctccaa      360
ccttgttata gtttccctcc tttgatctca caggaaccct ttcttctttg agcattttct      420
tgtggcgttc tgtagtaata ttttaatttt gggcccgggt tctgagggta ggtgattatt      480
cncagtgatg tgctttccct ataaggtcct ctatgtgtaa gctgttaggg tttgtgcgtt      540
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<210> 22
<211> 881
<212> DNA
<213> Eucalyptus grandis

<400> 22
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aaaacaaacg cctcttgatt tcctcaaacc ccaaaccgaa tccctcgtca aggggcaagg      180
cttttggtcc cgcggcccca cggatcgctc gttcccgtct cgccacgtcg cgtcgcagcg      240
tgtcgagcaa acagagggt ccgagcgact ataaaatccc gacgcgccatcg acaccacagt      300
ccatcgaaaa ccttgttcaa ttcccaagtg aaagtgagta actgtgaacg aagagttgaa      360
ctttgcatct cggcgtgtgg attcaagagg aagcagcaaa gtggaaatgg acaactccaa      420
gatgggcttc aatgcagggc aggccaaggg ccagactcag gagaagagca accagatgat      480
ggataaggca tccaacactg ctcaatctgc aagggattcc atgcaagaga ctggtcagca      540
gatgaaggcc aaagcccagg gtgctgctga tgcagtgaag aatgccaccg ggatgaacaa      600
atgaagagct caagacatga atgaataaat aattaagctc tggttatcat ttgcttttcc      660
ggtcgtttgt tgtcctgttt ttccttgtca agagcttatt atgagggtcc ttttgctctt      720
tccttagttc tttttgtttc ttggttgttc catgaagaga gcaactctct gtgtttgaga      780
gtactcatct cgcttcataa ggtctcagta tgtagttgcc tttcgagaat gttatgttct      840
ctctcataat gctattctga ttttataaaa aaaaaaaaaa a                         881
```

<210> 23
<211> 350
<212> DNA
<213> Eucalyptus grandis

<400> 23
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tataattttt tttgatataa taaaaatgat ccataaactt ttgcttaatg tgcaacgtaa      120
accataatat attcaacgtg atgcttaaac tttaatcgag tatgcaatgt agtccataat      180
atattcaata tgatccttca atccaattga agtgtgcaat gtggtcgcta gattttttta      240
tgtattcaac ttagtctttta agctaccaac cttccaataa tttatgtttt agaaataata      300
tcgaacatct tttatattat tcaaggaata aaacgaacat gcatcaaaag                 350
```

<210> 24
<211> 49
<212> DNA
<213> Eucalyptus grandis

<400> 24
```
actatagggc acgcgtggtc gacggcccgg gctggtactt tttttttct                 49
```

<210> 25
<211> 909
<212> DNA
<213> Eucalyptus grandis

<400> 25
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acactcacct tgcatttata cgatggttgt gagcagtgca ggctggtggt gctgcaaatt      120
tatgatgctg atgtgatagg cagatgaatg gcagttgagc taagttaaag ccctcataca      180
tagatcagag caggaggagt agtatatata ggcatcttgg caagtcccta aaagagcggc      240
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ttcgtgtatt cccacatatt cctctctcgt tagaacgttc agaaatgggt ggcccttga      300
ctcttgatgc agaggttgag gttaagtctc ctgcagacaa gttctgggtg agcgtgagag      360
actccaccaa actgttccca aagatcttcc cggaccagta caagaatatt gaagtccttg      420
agggagatgg gaaggctcct ggctcagttc gcctcttcac gtatggtgaa ggttctccac      480
ttgttaaagt atcaaaggag aagattgatg gtgtggacga agcagacaag gtcgtgacct      540
acagcgttat agacggtgat ctcctgaagt actacaagaa tttcaatggc agcatcaagg      600
taattcctaa aggagacgga agcttggtga aatggtcgtg tgggtttgag aaggcaagcg      660
atgaaattcc tgatccccac gtaatcaagg acttcgcaat ccagaatttc aaagagcttg      720
atgagttcat cctcaaggca tagatgccgc caatcgtcta tccggatttg cactaaatat      780
caataaaata atgcggagct ggactccgca cttctatatg catctagtat gagagtcccc      840
tgctgtctct gtttgtattc acttgaaggg ttttctatta agctctcttt actgcctccg      900
aaaaaaaaa                                                             909
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<210> 26
<211> 430
<212> DNA
<213> Eucalyptus grandis

<400> 26
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tgtaccgtga gcacggaaac gtcgccgacg tattgggatt ggacccggaa ctcaaggtcc      180
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cagccgtgga                                                            430
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<210> 27
<211> 1253
<212> DNA
<213> Eucalyptus grandis

<400> 27
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tccattcttc tccaatggct gcgaatttcg tcattccaac caaaatgaag gcttgggtgt      120
accgtgagca cggagacgtc gccaacgtat tgggattgga cccggaactc aaggtccctg      180
aattgcaaga aggccaagtg ctggttaaag ttcttgccgc ggcgctcaat ccaatcgaca      240
ccgcgagagt gaagggggtt atcaagctcc cgggctttc tctaccggcc gtgccaggtt      300
acgatctcgc cggcgttgtg gtgaaggtgg ccgcgaagt gaaggagctc aaggtcgggg      360
acgaggtata tggatttatg tttcacgcca agaaagacgg gacgctggct gagtacgcag      420
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tcccagaaaa gtttgatgtt gtctacgata cagttgggga aattgagcgg gcagcgaagg      780
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ccgtcccatg atacacaaac gagaaagaaa taaagcgtcc acatggatct gccttaatca     1080
cgagtcctta attagtagtc gatggtgctt gctgtttgtc tccgtacatt cagcttctct     1140
ttgcatagta gtttctacat agtgcgtgta gagaagcaag tggatgtaca agtaaaataa     1200
ttacttttc tataaacaat attacaaact caaaaaaaaa aaaaaaaaa aaa            1253
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<210> 28
<211> 99
<212> DNA
<213> Eucalyptus grandis

<400> 28
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```

cttctccaat ggctgcgaat ttcgtcattc cgaccaaaa

<210> 29
<211> 927
<212> DNA
<213> Eucalyptus grandis

<400> 29
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gtggtcgacg gcccgggctg gtactctcac taattcttta gttttccaat ttagcccctt   120
ctgtaattgc tcatcttctt taccaaattc tctaatttgg ccggcgaagg gctgacaagg   180
gattggtcat gtcaccctca ccaaaggttg ccgaaggtcc ggtgacctca gctgacggcc   240
acctacacca aatctagctc actagcagcc taagcccttc atcaactcta gtgaaaggtt   300
ttgagtattt tttaataaaa aatatttaaa aaatatatag cgagagctca ttacaaaaaa   360
attttaaaaa aaaatctaaa cattacttga actcaaagtg actttataaa gagtttttac   420
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aacccactgt ctaatagaga taaggtaaat gttataaacc aaattccaaa attccgaagc   540
actaaatata tttgctgatc ttataatcgc caattgagag ggtctcattc tccaagggat   600
tgtgacatat tagtaattga tagggtctca tccgtaggac tccgactcag ccgcgccacg   660
tgactggatc gctgaacggc gcggaaccag aggagcgtga ttacctaata ttttctccta   720
ccttggcctt gagattgaat ttcagaaaaa gaaaaagaaa aaggaacaac ttcgccgact   780
gttctataaa atgcatgcgc caccccgacc cccacccacg catcacatcc atccagcctc   840
cacgacagac gcataaacac aacacacgtc ggttagagag agagagagag agagagagag   900
agagagagag atgcttggac agttgtc   927

<210> 30
<211> 411
<212> DNA
<213> Eucalyptus grandis

<400> 30
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tgaccccgac gaccttgact ccatacttca cgcctcagct ttgtgttgga tggtcttgac   180
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ttgcacgctc tttctatcca ctttattatg ccatcacatg agcgttttcc acgcgtaaat   360
cggctaccac ccactttcac acggcggcga aacgagaaaa aggtcctacc t   411

<210> 31
<211> 178
<212> DNA
<213> Eucalyptus grandis

<400> 31
cgagtcagca gaaacccagt tacactccgc ccaaacggaa gctaaacctg atgggccata   60
cgatttcttt cactgagcct cttgcttttc ctccggaatc tcacggcacc ggaatgccgg   120
aggaacttgg gaagaaccaa tgatgcctgg tcactgagtg atcgatgaat gcaatagt   178

<210> 32
<211> 178
<212> DNA
<213> Eucalyptus grandis

<400> 32
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tgggatttag tatgttgatt gagtacccgt cgccaccacc ttcaagtaaa tcaggagtca   120
gcagaaaccc agtacactcg ccaaacggag ctaaacctga tggccatacg atttcttt   178

<210> 33
<211> 178
<212> DNA
<213> Eucalyptus grandis

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<400> 33
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tcactgagcc tcttgctttt cctccggaat ctcacggcac cggaatgccg gaggcaac      178
```

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<210> 34
<211> 1274
<212> DNA
<213> Eucalyptus grandis
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```
<400> 34
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accataatat attcaacgtg atgcttaaac tttaatcgag tatgcaatgt agtccataat     180
atattcaata tgatccttca attttaattg aatgtgcaat gtggtcgcta gattttttta     240
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cgaacatctt ttatattatt caaggaataa aacgaacatg catcaaaagt ttaaatatat     360
caaataaaat aaaattttaa gaattatatt acatattaaa attaaagttc atgattaaat     420
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caaggaaggg atccctccgg accagcagag gcttatcttt gctggcaagc agctggaaga     960
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ggccgattat aacattcaga aggagtccac cctccacttg gtgctccgtc tcaagggagg    1260
catgcaaatc tttg                                                    1274
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```
<210> 35
<211> 795
<212> DNA
<213> Eucalyptus grandis
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```
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gccaatgcca agttctctag caagagctcc tctcactcct tccccactca atgcttctct     180
aagaggctcg aggtggcgga attctcaggc cttcgtgctg gatcgtgtgt gacttatgcg     240
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ggaaaacata ttcaagctgg tgccaagaaa gttatcatca ctgcaccagc aaaaggcgct     720
gatataccca cctacgtcta tggtgtgaat gagacagatt attcgcatga agttgctaac     780
ataatcagca atgct                                                   795
```

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<210> 36
<211> 1200
<212> DNA
<213> Eucalyptus grandis
```

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<400> 36
aaaatatcca tcgacagcat caccccgctt agagaacggt gtctcggctt ctcacaatgt      60
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ctatagccga atgtacaaaa tcggcataat gttctataat atagcggact ttacagatga      120
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cttcaagaag gagaaatacg acaagaaccc tgctttatat ggtgaactgg caaagcagag     1140
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<210> 37
<211> 648
<212> DNA
<213> Eucalyptus grandis

<400> 37
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gttctattta tggggcgaaa caggggaggg gaaaccgaat ttaccaagat gcccttcttg      180
gtgggattgg acatggagct gcacgaccgt cgtcccatca cgaagagtct tgctcttcgg      240
tacacatgca atcgtcggcg aaccgacctt atccgaccgg ttccaagctt gtcctggtaa      300
aaggtttcga accttggaaa aggcttaaga gatgtatcgg tgccttaacc attattccat      360
gttcacataa tatttggccc ggttttcagg tcaattttgg agtagcccgg ttcggttcta      420
gtcccgctcc cgattcaaaa attcattggg aacaaatttt gacactgtct ggtatttttg      480
gtctaagacc ctacccaatt ttagaactgt acacccttgc tttatcccaa aataaaattg      540
tcaattagtc aactttttcac acttgatgat cgattaagta gatggatgac atggtctttt      600
accagcccgg gccgtcgacc acgcgtgccc tatagtgagt cgtattac                   648
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<210> 38
<211> 288
<212> DNA
<213> Eucalyptus grandis

<400> 38
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agaagtccgt cgacgacaat ggccgagaag agcaaggtcc tgatcatcgg agagaagagc      120
aaggtcctga tcatcggaga gaagagcaag gtcctgatca tcggagagaa gagcagggtc      180
cttatcatcg gagaatcgaa ttcccgcggc cgccatggcg gccgggagca tgcgacgtcg      240
ggcccaattc gccctatagt gagtcgtatt acaattcact ggccgtcg                   288
```

<210> 39
<211> 382
<212> DNA
<213> Eucalyptus grandis

<400> 39
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acagcaatct catctgatga ttcttcagtt cggagctcag aggatacatc atctatagct       60
gaattgagct gtgcaatctt ctcggcaagc accttcctcg ttttctgaaa atcatcagat      120
tttaaggtga atccatattt cgcagatggc catgttactg ctacactctc ttcacagcat      180
acatgaagga ggtcacatag caagcataca taggacctca tatacaaata tgacagcaga      240
ccagcccggg ccgtcgacca cgcgtgccct atagtagtag tggggaagga gtgagaggag      300
ctcttgatga ggaatgtcgg cttttcttcc atcagttgat gttccgggtt cctagtcatt      360
atgccgatgg tggccactcc ag                                              382
```

<210> 40
<211> 986
<212> DNA
<213> Eucalyptus grandis

<400> 40
```
aaatacaaac tggtttaata ttcaactcag ataattacat gacaccacct aaataatgga      60
aagtcaagca aatagacata ttatccccac acataatcaa ctatattcat gactggagag     120
gtgctagatg gtatagagtc cctagttatt atttattttt ttgggcccga gaagatcctg     180
atggatctat gctgtttgat actttcagat ttgttttgtc tacagctcaa ataaattagt     240
gcttgggttt tgatatatta tctaatctga tacaagtctt tgtcctggcc aatttttgca     300
gagtttcctg caaaacagtg cactaaagct tccagaggac ctcatgccat gcccaagggc     360
accacctatg atggaacgga gaatcaaacc acagactgaa caggcgttga aatgccccag     420
atgtgattct acaaacacaa aattctgtta ctataacaac tacaatcttt cacaacctcg     480
ccatttctgc aagacctgca ggcgatactg gaccaaagga ggtgccttac gtaacgttcc     540
tgttggtggg ggttgcagaa agaataaacg agccaagcga gcagtagacc atcctgtctc     600
tgctcagaat gaagcatcca cctctgcagc cccaggcaac gaagtacctg accggtctcc     660
ctttgagcca ccatcttcaa aatccattta ctatggggga gaaaacatga acttaaccgg     720
tctccccttt agcagaattc agcaggaccg agctgcattg gcccactgca actcttcttc     780
ctttctagga atgtcatgtg gcacccaatc ggcctctctg gaaccacatc tttcggcttt     840
aaatacattt aattcattca agtctaacaa tcctggtctg gattttccta gcttaagcac     900
agaccagaat tcactgtttg agaccagcca gccacaactg tcaagagcaa tggcatctgc     960
cctttttttct atgccaatgg ctcctg                                          986
```

<210> 41
<211> 313
<212> DNA
<213> Pinus radiata

<400> 41
```
aaaggaaaat tcaaagatct ttagccaatt tttgttgttg tgaccttgaa tttctaaaaa      60
atttaatgga ttcgtttttct aaattcctga ttcgtcaaag gctgaagggc acgatagtaa     120
tagaaaatgg acggcagttt atcctttcat ggctggacac acagaatttg tggagggact     180
ctccattctg gtttatccgc cgttagttct ctctgtactc cacccttagt tctctttgta     240
ctcgagacct ttaatgatta gccctgctta tgctgtcatt actgaactca cttccagagc     300
cccaaaaatc tct                                                         313
```

<210> 42
<211> 713
<212> DNA
<213> Pinus radiata

<400> 42
```
taattcacaa gtagaaaatg agattttttgc aattttgtaa ctaacatttc ccggtctcct      60
ctgtatgttt tcaccccttta atgtaattga aatttgcacc cgggttagat tcaaagcgga     120
gaataacatc ggggccttgt tctagacaga gattttttcac aaataacagg ttcgaaggta     180
tgtgtagaca tctgggtagt tgtagaataa agacggagcc cattaggtga tccaatcgaa     240
gagctcagat gggaaaacag ataaaaatta tcgggtggac cttccttcac atgttaatta     300
tatatcaagt gtcgccaatc cttatgtgaa acatttagta aagcttcgcc agagcacttc     360
ttataggcat tctgtgggct ctgttgttgt ggttggaagt actcctttaa gggaggtatc     420
tgaatatttg caacagaagt cagttaaaca agtggttgac tgtctgtttg tacaagatgt     480
tactggcata cctgtgggct tgatagagac ttccaggcgc attgtgcatg taaatcattt     540
ggtgatgcag aagctagccg gagtagagtc tatagagccc actgaagcaa ttggtgtaat     600
caagcttcct agcagcttct acaacttgga atctcttgaa attcactcta gttcccagat     660
atggtgctcg tcgccacatc gtctgcttgt acttgatggc attcaggatc ctg            713
```

<210> 43
<211> 28
<212> DNA
<213> Pinus radiata

<400> 43

```
ccacctcaca tcaataaatt ttatacga                                           28
```

<210> 44
<211> 35
<212> DNA
<213> Pinus radiata

<400> 44
```
gctgtttcat tggggtcata gctacgtggt gctga                                   35
```

<210> 45
<211> 1729
<212> DNA
<213> Pinus radiata

<400> 45
```
cttattgaca tataaaagca aagttggatc catctgttat tttgggtccc ctccagaagc        60
cttactaaat gcggacaaaa aatccacgta aagaacttct gaatttaccg tcatctgggc       120
tctgtaatta cgaatttagg gtttcctctg tcaatatctg gtagtgacaa acaaggttta       180
atggcagcct tagcaacaac tgaagtttgt gatacatatc cacgccttgt ggagaatggt       240
gagcttcgtg tcttgcaacc aattttccag atatatggtc gacgtcgagc tttctctgga       300
cctatagtta cactgaaggt ctttgaggac aatgtccttt tgcgggaatt ccttgaggag       360
agaggtaatg gaagagtttt ggtagttgat ggaggaggaa gccttagatg tgccatactg       420
gggggcaatg tagttgtatc tgcccaaaac aatggttggt ctggaataat tgtcactggc       480
tgcataaggg acgttgatga aataaacaga tgtgacattg gtataagagc actgacatct       540
aacccactga aggccaacaa gaagggtgtg ggtgaaaaac atgcgcctat ttacattgct       600
ggtacccgca ttcttccggg ggaatggtgt tatgctgaca gtgatggtat tcttgtttca       660
cagcaagagt tatcactgtg agataataaa attcataagt ttcagattgt gactttcatg       720
tcctgtggaa catatatttg actcgagtta gattctaata ggattaattg atagattctg       780
aaaattgagg aatatctctg gtcatgaaaa tcttcttctc atgtgatctt ttatgctcag       840
ctttgagtac aggatgataa gaagtttgtg catgtttgtc taaaggttta gcaagtatta       900
tcggaccatc ataagagata gattatggaa ctcagggact tgctattttt aatccaaaat       960
aacatttatt ctttgtgttt ttgccaaatt aacttttatt tcccttggca ccactagtga      1020
tttgcaatat ccagttgctg agaacataga agtgggcaac ggtgagagtt gcaacagtat      1080
ctagcataga tttaacaagt attgttggat cattataaga aaataaacta cagaaccaag      1140
ggaatctagt tgacaacata gttaaagtag gcatggtgct actgtatcga tacatcttca      1200
taaacagaaa aatatgaaca agctctaatg atgggagaaa ctccagcttg gtgttttgat      1260
taagcatcca tattcacacc taaaaggtta caagttccaa aataaaaatt ccaatgaatt      1320
tagccaatct aatcagacct tataagaaat acactaggca tctggggatc aaaatccagt      1380
agtttagaaa gtagttgtaa ataacccaga gacaaaaatc tcaatgatag cttgcttggg      1440
tcataggttt gataataatt gaaaacatag ttgaaaggag aatcctagca atggctagct      1500
tgaataatag atgtacagca aaattacagt agttgagaac aaagatggaa ggataatccc      1560
aacgatagct agcttggaca gtaggatgat tacatcaaaa tcatagcagt tgagaacata      1620
gttggaagga gaatccttat gatggctacg ttggataata ggcgtgatta tcgtaggtag      1680
attagagcac aagatcaaac taatagctgg cgcagctatc gactatttt                  1729
```

<210> 46
<211> 1038
<212> DNA
<213> Pinus radiata

<400> 46
```
tgattactat agggcacgcg tggtcgacgg cccgggctgg taaatgagaa catgataagc        60
tgtgtaaatt catgctagtc accataactt ttctcattgc ttttcatcca cactgttgat       120
tcattcatta tataagatca gattcgtatg atatacaggc aaccatagaa acaaccagca       180
aagttactag caggaaatcc aactaggtat catgaagact accaacgcag gctcgataat       240
gttggtgctc attatttttg ggtgctgttt cattggggtc atagctacat cttttgattt       300
ctattacttc gttcaacagt ggcctggttc atactgcgat actcgtagag gatgctgtta       360
ccctcgcacg ggaaggcctg cttccgaatt ttccattcat ggcctctggc ccaactacaa       420
gaccggtaaa tggccacagt tctgtggttc ctccgaagaa ttcgactact caaagatctc       480
agatctggag gaggagctga acaggtattg gggttcgtta agctgtccaa gcagcgatgg       540
acaggaattt tggggacacg agtgggagaa acatggcact tgctctctca atcttgatga       600
gcattcatac tttgagaagg ctctctcctt gagacaaaat atagacattc ttggggctct       660
```

```
taaaactgca ggtattaaac ccgatggaag ccaatacagt ttgagcgata tcaaggaagc     720
cattaaacaa aacactgggc agctcccagg aatcgattgc aacacgagcg cagagggaga     780
gcatcaacta tatcaggtgt atgtgtgtgt tgataaatcc gatgcttcca ctgttattga     840
atgccccatt tatccacaca gcaattgccc atccatggtt gtgtttcctc cttttgggga     900
ggatcaggag gaccgagatg gttacacaga aggaatgtac gagctgtaga tctggacaaa     960
cagcatttct tctctccgca tttgatttt atcaatgaaa tttccgattc caacatttg     1020
taaaaaaaa aaaaaaaa                                                   1038
```

```
<210> 47
<211> 91
<212> DNA
<213> Pinus radiata
```

```
<400> 47
aattttccat tcatgcctct gcccaactac aagaccggta aatggccaca gttctgtggt      60
tcctccgaag aattcgatat caagcttatc g                                    91
```

```
<210> 48
<211> 91
<212> DNA
<213> Pinus radiata
```

```
<400> 48
gcttttcatc cacactggtg cctcattcat tatataagat cagattcgtg tgatatacag      60
gcaaccatag aaacaaccgg caaagttact a                                    91
```

```
<210> 49
<211> 809
<212> DNA
<213> Pinus radiata
```

```
<400> 49
tgatatatat aacttctagc agaatgacac gcgacttgta tatcttttca ttttttaacc      60
catgaaaacc gattagggta ttgcaaatta gggcattgcc attcaaataa ttctcagatg     120
aaagattctc tctaacaatt acaaatgatt attttttcc atgagtgttg catgttcgaa      180
cggtctgccc agtctgtgag agagcataga gaaccctccc tgcccaattt gttagagcat     240
agagaaccct actgcatgag tagtaagaaa aatattcggt ctcaattcgg caaagaccac     300
ctcgaatgga tgacttcaac gacaatctca tgatagtgtt ctgatcagca ccagttcacc     360
tatatatttt atctagggtt tagtttgcat gtatcaatcc tctggtgcac taggtaattc     420
tttcccagta tcatatatcc ttaatactgt tttgtctttt aatccatggc taccatcaga     480
acaagctcaa agcagaataa gggagcatca gccatcctct tgcttatcgc gattgcaggg     540
ttagtaaatg cgtgcaacgc tgtgggtatt gagccaatgt gcgacactgt ggtgtcgagt     600
cttctgaggc ttctgccatg caggacggct gttgatccct caattgccgc cattccactt     660
ccaagctgct gcaacgcggt tgagtcagct gggcttcaat gcctctgtct cgtcgttaac     720
ggccctcctt ttccaggggt cgaccgcggc ctcgcaatgc agctgcctgc caaatgccat     780
ctcacccttc ctccctgtaa cagttagtt                                      809
```

```
<210> 50
<211> 428
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 50
tttcttgtga ctattcattt tcctcctgat tatccattca agcccccgaa ggttgcattt      60
aggactaaag ttttccaccc aaatataaat aacaatggaa gtatctgcct tgacatcttg     120
aaggaacagt ggagtcctgc tttgacaatc tccaaggttt tgctctcaat ttgctctttg     180
ttgacggatc caaacccaga tgatcctctt gtaccagaga ttgctcatat gtacaagact     240
gataggggca aatatgagtc cactgcacgg agttggactc agaaatatgc aatgggttaa     300
ctttaaaaac tatatatcag tgatggaact ttatccctaa gttggaatct cttcgaatca     360
atgacttgtt tgcttgtaag aaatgtttcc ttaagataag tggctttcct caaaacttga     420
ttgaagtg                                                             428
```

```
<210> 51
```

<211> 525
<212> DNA
<213> Pinus radiata

<400> 51
cccttctttg ccttcaacta atcctgctca tcctctcctg cccccattcc caaagatggc   60
tgcacccaga tcatccgcta aattgggtgc acttttggca atactgctca tagttgcggc   120
agcgcaggct caagattgct caaatgccat ggacaaattg gctccatgca cttcagcagt   180
gggactgtct agcaatggag tgaagccctc atctgagtgc tgtgatgccc tcaaaggaac   240
cagtactggc tgcgtctgca agtctgtgag agcagtgata tcacttcctg ctaagtgcaa   300
tctcccagcc ataacctgct ctggatctcg ctgaaggctc tctgttatgg cgattctcag   360
atcgtggatc tctttaagat tttcagcaag caagtgatag aataaattct cagattttga   420
gatatctata tagcgatttt cagtatcaga ttgtctatag tactcatata tttaagtgat   480
tgaatagcat ctccgattcc cgagttggaa acacagacac aatga   525

<210> 52
<211> 1126
<212> DNA
<213> Pinus radiata

<400> 52
actagtgatt actatagggc acgcgtggtc gacggcccgg gctggtaaat acccaactta   60
atttaattgt tattgagcca gagagatgcg tagtcgctca tgtcacttgt gtttaccaaa   120
aagacataca taaacacctg cacctaaaag ttataatgat aacatgcata caaccctaca   180
acgtacgtag tcacatgcgg ctagaactta aacccctacc acaaacatag ccacctgcac   240
ccagaagtta taataataac atacatagaa cccttacaat aaaaaaagtt atctccaatg   300
attattaatc tactgcaggc cagccatact cagcttgaac gtgaaaattc gcattgtaag   360
catggcgcca cattaaaata acctcggcaa tattttcatg tccaagtggc cggccagcca   420
cgctcctcgc actctgagaa tactctattc atccacttgt ctctgccccg caactcatat   480
aaatgtggcc aacccaagca ccatatccat gttcattaat cccctctttg ccttcaacta   540
atcctgctca tcccctcttg ccccaattcc caaagatggc tgcacccaga tcatccgcta   600
aatcggctgc acttttcgca atactgctca tagttgcggc agtacaggct gaagattgct   660
caaatgccat ggacaaattg gctccatgca cttcagcagt gggactgtct agcaatggag   720
tgaagccctc atctgagtgc tgtgatgccc tcaaaggaac cagtactggc tgcgtctgca   780
aatctgtgag agcagtgata tcacttcctg ctaagtgcaa tctcccagcc ttaacctgct   840
ctggatctcg ctgaaggctc tctgttatgg cgattctcag atcgtggatc tctttaagat   900
tttcaggaag caagtgatag aataaattct cagatgttga gatatctata tagcgatttt   960
cagtatcaga ttgtctacag taccaatata tttaagtgat tgaatggaat tctcggattc   1020
tgagatagaa atataggcac agaatgtggc cggaggaatg ttcgaattcg agaatgataa   1080
taaataataa atgattgatt tctctctgca aaaaaaaaaa aaaaaa   1126

<210> 53
<211> 454
<212> DNA
<213> Pinus radiata

<400> 53
atcctgctca tcctctcctg cccccattcc caaagatggc tgcacccaga tcatccgcta   60
aattgggtgc acttttggca atactgctca tagttgcggc agcgcaggct caagattgct   120
caaatgccat ggacaaattg gctccatgca cttcagcagt gggactgtct agcaatggag   180
tgaagccctc atctgagtgc tgtgatgccc tcaaaggaac cagtactggc tgcgtctgca   240
agtctgtgag agcagtgata tcacttcctg ctaagtgcaa tctcccagcc ataacctgct   300
ctggatctcg ctgaaggctc tctgttatgg cgattctcag atcgtggata tctttaagat   360
tttcagcaag tgatagaata aattctcaga ttttgagata tctatatagc gattttcagt   420
atcagattgt ctatagtact catatattta agtg   454

<210> 54
<211> 335
<212> DNA
<213> Pinus radiata

<400> 54
agaagcacct gttaaaaagg aggcctgctc tttgttcatg agcttataga taagccctag   60

```
tctgcaagga ttattgccct gtagttattt ggaagtagat cattttcaca ggcccagatg      120
cattatattc taatgcagtt gtttgttaat tgaagtgcaa atagttccaa aatgtttaca      180
tgaatcaata gtgaacaaat ccctctgttt tatatcatat tgatggatta ttcgattttt      240
tggtgacgtg gcgcgaaact gcttttcgaa ctcatggaaa tagtaattgt tataatccat      300
aggcatgaga ttcttgttaa tcgtgcacaa ggttt                                 335
```

```
<210> 55
<211> 336
<212> DNA
<213> Pinus radiata
```

```
<400> 55
aaaccttgtg cacgattaac aagaatctca tgcctatgga ttataacaat tactatttcc       60
atgagttcga aaagcagttt cgcgccacgt caccaaaaaa tcgaataatc catcaatatg      120
atataaaaca gagggatttg ttcactattg attcatgtaa acattttgga actatttgca      180
cttcaattaa caaacaactg cattagaata taatgcatct ggtgcctgtg aaaatgatct      240
acttccaaat aactacaggg caataatcct tgcagactag ggcttatcta taagctcatg      300
aacaaagagc aggcctcctt tttaacaggt gcttct                                336
```

```
<210> 56
<211> 532
<212> DNA
<213> Pinus radiata
```

```
<400> 56
cgttcgttcc cttccctttc cattgttgcg tttaagccct ccaattttct tttggcgtcc       60
cgttttgggg gctcccttga agatctcctc ttcatttcgg gatttcctgc cttcgccgcg      120
ccatttgaag ttcttttttct gagagaagaa tttagacatg gctgatcgca tgttgactcg      180
aagccacagc cttcgcgagc gtttggacga gaccctctct gctcaccgca acgatattgt      240
ggccttcctt tcaagggttg aagccaaggg caaaggcatc ttgcagcgcc accagatttt      300
tgctgagttt gaggccatct ctgaggagag cagagcaaag cttcttgatg gggcctttgg      360
tgaagtcctc aaatccactc aggaagcgat tgtgtcgcct ccatgggttg ctcttgctgt      420
tcgtccaagg ccgggcgtgt gggagcacat ccgtgtgaac gtccatgcgc ttgttcttga      480
gcaattggag gttgctgagt atctgcactt caaagaagag cttgctgatg ga              532
```

```
<210> 57
<211> 3103
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 57
gggtgaaaac aattaatgag atcatttgaa ttaaggaaag tggaaaggcg gttttctgat       60
tggtacactg aaacaacagg aaggtggtgg aggccgcaat gatggaattt atccacttta      120
atcattttat gaaatcgata cactaacctt tgtttctcct aaacccaaag gcattaatcc      180
ctgtcctcct cactcgatct cgaaggccag aaggggagg ccgagcctct tgctttttttt      240
cgtgtataaa agggcctccc ccattcctca tttttcacca tcctccgttc gttcgttccc      300
ttcccttttcc attgttgcgt ttaagccctc caattttctt ttggcgtccc gtttttgggg      360
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caagggttga agccaagggc aaaggcatct tgcagcgcca ccagattttt gctgagtttg      600
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cgggcgtgtg ggagcacatc cgtgtgaacg tccatgcgct tgttcttgag caattggagg      780
ttgctgagta tctgcacttc aaagaagagc ttgctgatgg aagcttgaat ggtaactttg      840
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ctattggcaa tggcgtcgag tttctcaatc gccatctctc cgctaagctc ttccatgaca      960
aggaaagctt gcaccctctg cttgaattcc tccaagtcca ctgctacaag gggaagaaca     1020
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agctcctgtt ggatctcctt gaggctcccg acccgtgcac tctcgagaag ttcttggata     1260
gggttcccat ggtcttcaac gtcgtgatca tgtctccca cggatacttt gctcaggacg     1320
```

```
acgtccttgg ttatccggat accggtggcc aggttgttta catcctggat caagttcgtg      1380
ccctagagga agaaatgctt caccgcatta agcaacaagg actggatatt actcctcgga      1440
ttctcattat cactcggctt cttccagacg cggttggaac cacctgtggc cagcgccttg      1500
agaaagtttt tgggaccgag tactcccaca ttcttcgcgt ccccttcaga aatgagaagg      1560
gagtcgtccg caagtggatt tcccggttcg aggtgtggcc ctatttggaa agatacactg      1620
aggatgtcgc gagcgaactt gctggagagt tgcagggcaa gcctgatctg atcatcggaa      1680
actacagtga tggaaacatt gttgcttcct tgttagcaca taaattaggt gttacacagt      1740
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aatttgagga aaagtaccac ttctcttgcc agttcactgc tgatctcatc gccatgaacc      1860
acaccgactt cattatcacc agcaccttcc aagaaattgc tggaagcaag gatacagtgg      1920
ggcagtatga gagtcacatg aacttcactc ttcctggact ctaccgagtt gtccacggga      1980
tcgacgtctt cgacccgaag ttcaacattg tttcaccagg tgctgacatg agcatctact      2040
ttgcttacac cgaacaggag cggcggttga aatccttcca ccctgagatc gaggaactcc      2100
tcttcagcga tgttgagaac aaggaacact tgtgtgtgtt gaaagataag aagaagccta      2160
ttattttcac catggcaagg ctggaccgtg tcaagaactt gacagggctt gttgagtggt      2220
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aaaagtacaa gctgaatggc cagttcaggt ggatttcctc ccagatgaac cgggtgagga      2400
atggagagct ctaccgctac atctgtgaca cgaacgggag cttcgttcaa ccggctatct      2460
atgaagcttt cgggttgacc gtggttgagg ccatgacttg tggattgcca accttttgcca      2520
cttgcaatgg tggaccagct gagatcattg tgcatggcaa atcgggctac cacattgatc      2580
cttaccatgg tgaccaggcg gccgagcttc ttgtagactt cttcaacaag tgcaagattg      2640
accagtccca ctgggacgag atctcaaagg gtgccatgca gagaattgaa gagaagtata      2700
catggaaaat atattctgag aggctgttga acctgactgc cgtgtatggc ttctggaagc      2760
atgtgactaa ccttgatcgg cgcgagagtc gccggtacct tgaaatgttc tatgccctca      2820
agtatcgccc actggcacag tctgttcctc cggctgtcga gtaaacaaag agacagattg      2880
ttaccagaag acggaagcat tggacttttg aagttttcaa ggaataaaca ttggaaattg      2940
tttgaatttg ggattgccaa gagcgatctt tttcgtttcc ttttttttggt ccttttttctc      3000
ttctttgttt ccattccgcg aatgtttgca ttttggggtt tgtacccatc aattcagtaa      3060
atggttcatt ttcttttcaa aaaaaaaaaa aaaaaaaaaa aaa                        3103
```

```
<210> 58
<211> 326
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 58
ctcgaaaccg agacgctgac tgtgggttga gctctaacca atgggagtga tgtctctctt       60
acgtgcctgc cgtgggcccc agtgacgggc cccaaaagtg taaacgaagg aagctcccgg      120
ggatctgatt ggccgcgacg tccgcctctg acgtggcacc accgacgatt ttttttttaat      180
atcttggtca agtcctaatt taactatggg gtccagatta gaagcttatc cactatggat      240
taaattaaat caaatgggaa ttaaattaaa ttaaaatcat cgtgcggagg tgcacgagat      300
gcacgagatc cgacggcgca gagcag                                           326
```

```
<210> 59
<211> 311
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 59
attactatag ggcacgcgtg gtcgacggcc cgggctggta ctctcactaa ttctttagtt       60
ttccaattta gccccttctg taattgctca tcttctttac caaattctct aatttggccg      120
gcgaagggct gacaagggat tggtcatgtc accctcacca aaggttgccg aaggtccggt      180
gacctcagct gacggccacc tacaccaaat ctagctcact agcagcctaa gcccttcatc      240
aactctagtg aaaggttttg agtatttttt aataaaaaat atttaaaaaa tatatagcga      300
gagctcatta c                                                           311
```

```
<210> 60
<211> 2096
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 60
```

```
gattactata gggcacgcgt ggtcgacggc ccgggctggt ctgagccatt taattcgaga          60
gcacatcgcc caaaattatt cttcttgctg ccataactgt cgaattttct cttttaggta         120
agtaaccaat gatgcatcat gttgacaaaa aggctgatta gtatgatctt ggagttgttg         180
gtgcaaattt gcaagctgac gatggcccct cagggaaatt aaggcgccaa cccagattgc         240
aaagagcaca aagagcacga tccaaccttt ccttaacaag atcatcacca gatcggccag         300
taagggtaat attaatttaa caaatagctc ttgtaccggg aactccgtat ttctctcact         360
tccataaacc cctgattaat ttggtgggaa agcgacagcc aacccacaaa aggtcagatg         420
tcatcccacg agagagagag agagagagag agagagagag agagttttct ctctatattc         480
tggttcaccg gttggagtca atggcatgcg tgacgaatgt acatattggt gtagggtcca         540
atattttgcg ggagggttgg tgaaccgcaa agttcctata tatcgaacct ccaccaccat         600
acctcacttc aatccccacc atttatccgt tttatttcct ctgctttcct ttgctcgagt         660
ctcgcggaag agagagaaga gaggagagga gagaatgggt tcgaccggat ccgagaccca         720
gatgaccccg acccaagtct cggacgagga ggcgaacctc ttcgccatgc agctggcgag         780
cgcctccgtg ctccccatgg tcctcaaggc cgccatcgag ctcgacctcc tcgagatcat         840
ggccaaggcc gggccggggcg cgttcctctc cccggggggaa gtcgcggccc agctcccgac         900
ccagaacccc gaggcacccg tcatgctcga ccggatcttc cggctgctgg ccagctactc         960
cgtgctcacg tgcacccctcc gcgacctccc cgatggcaag gtcgagcggc tctacggctt        1020
agcgccggtg tgcaagttct tggtcaagaa cgaggacggg gtctccatcg ccgcactcaa        1080

cttgatgaac caggacaaaa tcctcatgga aagctggtat tacctgaaag atgcggtcct        1140
tgaaggcgga atcccattca acaaggcgta cgggatgacc gcgttcgagt atcatggcac        1200
cgacccgcga ttcaacaaga tctttaaccg gggaatgtct gatcactcca ccattactat        1260
gaagaagata ctggaaacat acaagggctt cgagggcctc gagaccgtgg tcgatgtcgg        1320
aggcggcact ggggccgtgc tcagcatgat cgttgccaaa tacccatcaa tgaaagggat        1380
caacttcgac cgccccaacg gattgaagac gccccacccc ttcctggtgt caagcacgtc        1440
ggaggcgaca tgttcgtcag cgttccaaag ggagatgcca ttttcatgaa gtggatatgc        1500
catgactgga gtgacgacca ttgcgcgaag ttcctcaaga actgctacga tgcgcttccc        1560
aacaatggaa aggtgatcgt tgcagagtgc gtactccctg tgtacccaga cacgagccta        1620
gcgaccaaga atgtgatcca catcgactgc atcatgttgg cccacaaccc aggcgggaaa        1680
gagaggacac agaaggagtt cgaggcattg gccaaagggg ccggatttca gggcttccaa        1740
gtcatgtgct gcgctttcgg cactcacgtc atggagttcc tgaagaccgc ttgatctgct        1800
cctctgtggt gatgttcatg gttcttggat ttgaaaggtc gtgaaggagc ccttttctca        1860
cagttggctt cggcatacca agttcttctc ataaaaggaa acaataagaa gcgactgtat        1920
gatggcgcaa gtggaagtta caagatttgt tgttttatgt ctataaagtt ttgagtcttc        1980
tgcatactga tttcacagaa tgtgtaacga aacggcgtat atggatgtgc ctgaatgatg        2040
gaaattgtga tattctgtct tcttttttcag taaatcactt cgaacaaaaa aaaaaa        2096
```

```
<210> 61
<211> 522
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 61
ctaaaacgct aatcctgccc tgcccttccc ttctgctgct gctgctcgtc acctctctct          60
ccctctcgcg gccagctgcg agatctgccg agtttaagcc tcgtacatca aaatgggtaa         120
ggagaagatt cacatcagca ttgtggtcat tggccatgtc gattctggga agtcaaccac         180
aactggccac ttgatataca agctcggagg aatcgacaag cgtgtgattg agagattcga         240
gaaggaagct gctgagatga caagagatc gttcaagtat gcttgggtgc ttgacaagct         300
caaggccgag cgcgagcgcg gtattaccat tgatattgcc ttgtggaagt tcgagaccac         360
caagtactac tgcactgtca ttgatgctcc tggacatcgt gactttatta agaatatgat         420
tactggaacc tcccaggccg actgtgctgt ccttatcatt gattccacca ctggtggttt         480
cgaagctggt atttccaagg atggccagac ccgtgaacat gc         522
```

```
<210> 62
<211> 420
<212> DNA
<213> Eucalyptus grandis
```

```
<400> 62
tttgatacgc taacaaacaa aacatgtgaa aagcttaatt atggcaatta tcataaatag          60
aaaaaaatta gaaaaaaaga gaggaaatgg gccattattt aaattgcaat cgaaagattg         120
agggcaattc tgtttctcta gtgtaaataa gggtgtattt aataattgag ggatggaaat         180
agcatggtca ctcggtaatt atcaaggaaa gcaagaataa aaatggaaaa aaaaaaaaaa         240
```

```
aaagcttgaa gaggccaatg tcgaaattat gagcgcgaga tgaggacact cctgggaaac      300
gaaaaatggc attcgcgggg ggtgctatat aaagcctcgt gtaagggtgc gttcctcact      360
ctcaaaccct aatcctgccc ttcccttctg ctgctgctgc tcgtcacctc tctcctccct      420
```

<210> 63
<211> 65
<212> PRT
<213> Eucalyptus grandis

<400> 63

```
Met Asp Asn Ser Lys Met Gly Phe Asn Ala Gly Gln Ala Lys Gly Gln
1               5                   10                  15
Thr Gln Glu Lys Ser Asn Gln Met Met Asp Lys Ala Ser Asn Thr Ala
            20                  25                  30
Gln Ser Ala Arg Asp Ser Met Gln Glu Thr Gly Gln Gln Met Lys Ala
        35                  40                  45
Lys Ala Gln Gly Ala Ala Asp Ala Val Lys Asn Ala Thr Gly Met Asn
    50                  55                  60
Lys
65
```

<210> 64
<211> 152
<212> PRT
<213> Eucalyptus grandis

<400> 64

```
Met Gly Gly Pro Leu Thr Leu Asp Ala Glu Val Glu Val Lys Ser Pro
1               5                   10                  15
Ala Asp Lys Phe Trp Val Ser Val Arg Asp Ser Thr Lys Leu Phe Pro
            20                  25                  30
Lys Ile Phe Pro Asp Gln Tyr Lys Asn Ile Glu Val Leu Glu Gly Asp
        35                  40                  45
Gly Lys Ala Pro Gly Ser Val Arg Leu Phe Thr Tyr Gly Glu Gly Ser
    50                  55                  60
Pro Leu Val Lys Val Ser Lys Glu Lys Ile Asp Gly Val Asp Glu Ala
65                  70                  75                  80
Asp Lys Val Val Thr Tyr Ser Val Ile Asp Gly Asp Leu Leu Lys Tyr
                85                  90                  95
Tyr Lys Asn Phe Asn Gly Ser Ile Lys Val Ile Pro Lys Gly Asp Gly
            100                 105                 110
Ser Leu Val Lys Trp Ser Cys Gly Phe Glu Lys Ala Ser Asp Glu Ile
        115                 120                 125
Pro Asp Pro His Val Ile Lys Asp Phe Ala Ile Gln Asn Phe Lys Glu
    130                 135                 140
Leu Asp Glu Phe Ile Leu Lys Ala
145                 150
```

<210> 65
<211> 117
<212> PRT
<213> Eucalyptus grandis

<400> 65

```
Met Ala Ala Asn Phe Val Ile Pro Thr Lys Met Lys Ala Trp Val Tyr
1               5                   10                  15
Arg Glu His Gly Asn Val Ala Asp Val Leu Gly Leu Asp Pro Glu Leu
            20                  25                  30
Lys Val Pro Glu Leu Gln Glu Gly Gln Val Leu Val Lys Val Leu Ala
        35                  40                  45
Ala Ala Leu Asn Pro Val Asp Ala Ala Arg Met Lys Gly Val Ile Lys
    50                  55                  60
Leu Pro Gly Phe Ser Leu Pro Ala Val Pro Gly Tyr Asp Leu Ala Gly
```

```
65                    70                    75                    80
Val Val Val Lys Val Gly Arg Glu Val Lys Glu Leu Lys Ile Gly Asp
                  85                    90                    95
Glu Val Tyr Gly Phe Met Phe His Ala Lys Lys Asp Gly Thr Leu Ala
              100                   105                   110
Glu Tyr Ala Ala Val
              115
```

<210> 66
<211> 318
<212> PRT
<213> Eucalyptus grandis

<400> 66
```
Met Ala Ala Asn Phe Val Ile Pro Thr Lys Met Lys Ala Trp Val Tyr
 1               5                   10                   15
Arg Glu His Gly Asp Val Ala Asn Val Leu Gly Leu Asp Pro Glu Leu
              20                   25                   30
Lys Val Pro Glu Leu Gln Glu Gly Gln Val Leu Val Lys Val Leu Ala
          35                   40                   45
Ala Ala Leu Asn Pro Ile Asp Thr Ala Arg Val Lys Gly Val Ile Lys
      50                   55                   60
Leu Pro Gly Phe Ser Leu Pro Ala Val Pro Gly Tyr Asp Leu Ala Gly
65                   70                   75                   80
Val Val Val Lys Val Gly Arg Glu Val Lys Glu Leu Lys Val Gly Asp
                  85                   90                   95
Glu Val Tyr Gly Phe Met Phe His Ala Lys Lys Asp Gly Thr Leu Ala
              100                  105                  110
Glu Tyr Ala Ala Val Glu Glu Ser Phe Leu Ala Leu Lys Pro Lys Lys
          115                  120                  125
Leu Arg Phe Gly Glu Ala Ala Ser Leu Pro Val Val Ile Gln Thr Ala
      130                  135                  140
Tyr Gly Gly Leu Glu Arg Ala Gly Leu Ser His Gly Lys Ser Leu Leu
145                  150                  155                  160
Val Leu Gly Gly Ala Gly Gly Val Gly Thr Leu Ile Ile Gln Leu Ala
                  165                  170                  175
Lys Glu Val Phe Gly Ala Ser Arg Val Ala Ala Thr Ser Ser Thr Gly
              180                  185                  190
Lys Leu Glu Leu Leu Lys Ser Leu Gly Ala Asp Leu Ala Ile Asp Tyr
          195                  200                  205
Thr Lys Val Asn Phe Glu Asp Leu Pro Glu Lys Phe Asp Val Val Tyr
      210                  215                  220
Asp Thr Val Gly Glu Ile Glu Arg Ala Ala Lys Ala Val Lys Pro Gly
225                  230                  235                  240
Gly Ser Ile Val Thr Ile Val Lys Gln Asn Lys Thr Leu Pro Pro Pro
                  245                  250                  255
Ala Phe Phe Phe Ala Val Thr Ser Asn Arg Ser Thr Leu Glu Lys Leu
              260                  265                  270
Lys Pro Phe Leu Glu Ser Gly Lys Val Lys Pro Val Ile Asp Pro Lys
          275                  280                  285
Ser Pro Phe Pro Phe Ser Gln Ala Ile Glu Ala Phe Ser Tyr Leu Gln
      290                  295                  300
Thr Arg Arg Ala Thr Gly Lys Leu Val Ile His Pro Val Pro
305                  310                  315
```

<210> 67
<211> 156
<212> PRT
<213> Eucalyptus grandis

<400> 67
```
Met Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu Glu
 1               5                   10                   15
```

Val Glu Ser Ser Asp Thr Val Asp Asn Val Lys Ala Lys Ile Gln Asp
20 25 30
Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly Lys
35 40 45
Gln Leu Glu Asp Gly Arg Thr Leu Ala Asp Tyr Asn Ile Gln Lys Glu
50 55 60
Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly Met Gln Ile Phe
65 70 75 80
Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu Glu Val Glu Ser Ser
85 90 95
Asp Thr Val Asp Asn Val Lys Ala Lys Ile Gln Asp Lys Glu Gly Ile
100 105 110
Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly Lys Gln Leu Glu Asp
115 120 125
Gly Arg Thr Leu Ala Asp Tyr Asn Ile Gln Lys Glu Ser Thr Leu His
130 135 140
Leu Val Leu Arg Leu Lys Gly Gly Met Gln Ile Phe
145 150 155

<210> 68
<211> 238
<212> PRT
<213> Eucalyptus grandis

<400> 68
Met Ala Thr His Ala Ala Leu Ala Pro Ser Thr Leu Pro Ala Asn Ala
1 5 10 15
Lys Phe Ser Ser Lys Ser Ser Ser His Ser Phe Pro Thr Gln Cys Phe
20 25 30
Ser Lys Arg Leu Glu Val Ala Glu Phe Ser Gly Leu Arg Ala Gly Ser
35 40 45
Cys Val Thr Tyr Ala Lys Asn Ala Gly Glu Gly Ser Phe Phe Asp Ala
50 55 60
Val Ala Ala Gln Leu Thr Pro Lys Thr Ser Ala Pro Ala Pro Ala Lys
65 70 75 80
Gly Glu Thr Val Ala Lys Leu Lys Val Ala Ile Asn Gly Phe Gly Arg
85 90 95
Ile Gly Arg Asn Phe Leu Arg Cys Trp His Gly Arg Lys Asn Ser Pro
100 105 110
Leu Asp Val Ile Val Val Asn Asp Ser Gly Gly Val Lys Asn Ala Ser
115 120 125
His Leu Leu Lys Tyr Asp Ser Met Leu Gly Thr Phe Lys Ala Asp Val
130 135 140
Lys Ile Val Asp Asn Glu Thr Ile Ser Val Asp Gly Lys Pro Val Lys
145 150 155 160
Val Val Ser Asn Arg Asp Pro Leu Lys Leu Pro Trp Ala Glu Leu Gly
165 170 175
Ile Asp Ile Val Ile Glu Gly Thr Gly Val Phe Val Asp Gly Pro Gly
180 185 190
Ala Gly Lys His Ile Gln Ala Gly Ala Lys Lys Val Ile Ile Thr Ala
195 200 205
Pro Ala Lys Gly Ala Asp Ile Pro Thr Tyr Val Tyr Gly Val Asn Glu
210 215 220
Thr Asp Tyr Ser His Glu Val Ala Asn Ile Ile Ser Asn Ala
225 230 235

<210> 69
<211> 168
<212> PRT
<213> Eucalyptus grandis

<400> 69
Met Ser Thr Ser Pro Val Ser Ser Trp Cys Ala Thr Ser Phe Ser Pro

```
 1              5                    10                        15
Ala His Ser Ser Leu Lys Arg Ala Ala Gly Leu Arg Pro Ser Leu Ser
            20                      25              30
Ala Arg Leu Gly Pro Ser Ser Ser Ser Ser Ser Val Ser Pro Pro Thr
        35                  40              45
Leu Ile Arg Asn Glu Pro Val Phe Ala Ala Pro Ala Pro Val Ile Asn
    50                      55                  60
Pro Thr Trp Thr Glu Glu Met Gly Lys Asp Tyr Asp Glu Ala Ile Glu
65                  70                  75                      80
Ala Leu Lys Lys Leu Leu Ser Glu Lys Gly Asp Leu Lys Ala Thr Ala
            85                  90                  95
Ala Ala Lys Val Glu Gln Ile Thr Ala Glu Leu Gln Thr Ala Ser Pro
            100                 105                 110
Asp Ile Lys Pro Ser Ser Ser Val Asp Arg Ile Lys Thr Gly Phe Thr
            115                 120                 125
Phe Phe Lys Lys Glu Lys Tyr Asp Lys Asn Pro Ala Leu Tyr Gly Glu
            130                 135                 140
Leu Ala Lys Gln Ser Pro Lys Phe Met Val Phe Ala Cys Ser Asp Ser
145                 150                 155                     160
Arg Val Cys Pro Ser His Val Leu
                    165
```

<210> 70
<211> 214
<212> PRT
<213> Eucalyptus grandis

<400> 70

```
Met Pro Cys Pro Arg Ala Pro Pro Met Met Glu Arg Arg Ile Lys Pro
 1              5                    10                      15
Gln Thr Glu Gln Ala Leu Lys Cys Pro Arg Cys Asp Ser Thr Asn Thr
            20                      25              30
Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Leu Ser Gln Pro Arg His Phe
        35                  40              45
Cys Lys Thr Cys Arg Arg Tyr Trp Thr Lys Gly Gly Ala Leu Arg Asn
    50                      55                  60
Val Pro Val Gly Gly Gly Cys Arg Lys Asn Lys Arg Ala Lys Arg Ala
65                  70                  75                      80
Val Asp His Pro Val Ser Ala Gln Asn Glu Ala Ser Thr Ser Ala Ala
            85                  90                  95
Pro Gly Asn Glu Val Pro Asp Arg Ser Pro Phe Glu Pro Pro Ser Ser
            100                 105                 110
Lys Ser Ile Tyr Tyr Gly Gly Glu Asn Met Asn Leu Thr Gly Leu Pro
            115                 120                 125
Phe Ser Arg Ile Gln Gln Asp Arg Ala Ala Leu Ala His Cys Asn Ser
            130                 135                 140
Ser Ser Phe Leu Gly Met Ser Cys Gly Thr Gln Ser Ala Ser Leu Glu
145                 150                 155                     160
Pro His Leu Ser Ala Leu Asn Thr Phe Asn Ser Phe Lys Ser Asn Asn
                165                 170                 175
Pro Gly Leu Asp Phe Pro Ser Leu Ser Thr Asp Gln Asn Ser Leu Phe
            180                 185                 190
Glu Thr Ser Gln Pro Gln Leu Ser Arg Ala Met Ala Ser Ala Leu Phe
            195                 200                 205
Ser Met Pro Met Ala Pro
            210
```

<210> 71
<211> 166
<212> PRT
<213> Pinus radiata

<400> 71

```
Met Ala Ala Leu Ala Thr Thr Glu Val Cys Asp Thr Tyr Pro Arg Leu
1               5                   10                  15
Val Glu Asn Gly Glu Leu Arg Val Leu Gln Pro Ile Phe Gln Ile Tyr
            20                  25                  30
Gly Arg Arg Arg Ala Phe Ser Gly Pro Ile Val Thr Leu Lys Val Phe
        35                  40                  45
Glu Asp Asn Val Leu Leu Arg Glu Phe Leu Glu Glu Arg Gly Asn Gly
    50                  55                  60
Arg Val Leu Val Val Asp Gly Gly Gly Ser Leu Arg Cys Ala Ile Leu
65                  70                  75                  80
Gly Gly Asn Val Val Val Ser Ala Gln Asn Asn Gly Trp Ser Gly Ile
            85                  90                  95
Ile Val Thr Gly Cys Ile Arg Asp Val Asp Glu Ile Asn Arg Cys Asp
            100                 105                 110
Ile Gly Ile Arg Ala Leu Thr Ser Asn Pro Leu Lys Ala Asn Lys Lys
        115                 120                 125
Gly Val Gly Glu Lys His Ala Pro Ile Tyr Ile Ala Gly Thr Arg Ile
    130                 135                 140
Leu Pro Gly Glu Trp Cys Tyr Ala Asp Ser Asp Gly Ile Leu Val Ser
145                 150                 155                 160
Gln Gln Glu Leu Ser Leu
                165
```

<210> 72
<211> 236
<212> PRT
<213> Pinus radiata

<400> 72
```
Met Leu Val Leu Ile Ile Phe Gly Cys Cys Phe Ile Gly Val Ile Ala
1               5                   10                  15
Thr Ser Phe Asp Phe Tyr Tyr Phe Val Gln Gln Trp Pro Gly Ser Tyr
            20                  25                  30
Cys Asp Thr Arg Arg Gly Cys Cys Tyr Pro Arg Thr Gly Arg Pro Ala
        35                  40                  45
Ser Glu Phe Ser Ile His Gly Leu Trp Pro Asn Tyr Lys Thr Gly Lys
    50                  55                  60
Trp Pro Gln Phe Cys Gly Ser Ser Glu Glu Phe Asp Tyr Ser Lys Ile
65                  70                  75                  80
Ser Asp Leu Glu Glu Leu Asn Arg Tyr Trp Gly Ser Leu Ser Cys
            85                  90                  95
Pro Ser Ser Asp Gly Gln Glu Phe Trp Gly His Glu Trp Glu Lys His
            100                 105                 110
Gly Thr Cys Ser Leu Asn Leu Asp Glu His Ser Tyr Phe Glu Lys Ala
        115                 120                 125
Leu Ser Leu Arg Gln Asn Ile Asp Ile Leu Gly Ala Leu Lys Thr Ala
    130                 135                 140
Gly Ile Lys Pro Asp Gly Ser Gln Tyr Ser Leu Ser Asp Ile Lys Glu
145                 150                 155                 160
Ala Ile Lys Gln Asn Thr Gly Gln Leu Pro Gly Ile Asp Cys Asn Thr
                165                 170                 175
Ser Ala Glu Gly Glu His Gln Leu Tyr Gln Val Tyr Val Cys Val Asp
            180                 185                 190
Lys Ser Asp Ala Ser Thr Val Ile Glu Cys Pro Ile Tyr Pro His Ser
        195                 200                 205
Asn Cys Pro Ser Met Val Val Phe Pro Pro Phe Gly Glu Asp Gln Glu
    210                 215                 220
Asp Arg Asp Gly Tyr Thr Glu Gly Met Tyr Glu Leu
225                 230                 235
```

<210> 73
<211> 92
<212> PRT

<213> Pinus radiata

<400> 73
Met Ala Ala Pro Arg Ser Ser Ala Lys Leu Gly Ala Leu Leu Ala Ile
1   5   10   15
Leu Leu Ile Val Ala Ala Ala Gln Ala Gln Asp Cys Ser Asn Ala Met
            20   25   30
Asp Lys Leu Ala Pro Cys Thr Ser Ala Val Gly Leu Ser Ser Asn Gly
        35   40   45
Val Lys Pro Ser Ser Glu Cys Cys Asp Ala Leu Lys Gly Thr Ser Thr
    50   55   60
Gly Cys Val Cys Lys Ser Val Arg Ala Val Ile Ser Leu Pro Ala Lys
65   70   75   80
Cys Asn Leu Pro Ala Ile Thr Cys Ser Gly Ser Arg
            85   90

<210> 74
<211> 92
<212> PRT
<213> Pinus radiata

<400> 74
Met Ala Ala Pro Arg Ser Ser Ala Lys Ser Ala Ala Leu Phe Ala Ile
1   5   10   15
Leu Leu Ile Val Ala Ala Val Gln Ala Glu Asp Cys Ser Asn Ala Met
            20   25   30
Asp Lys Leu Ala Pro Cys Thr Ser Ala Val Gly Leu Ser Ser Asn Gly
        35   40   45
Val Lys Pro Ser Ser Glu Cys Cys Asp Ala Leu Lys Gly Thr Ser Thr
    50   55   60
Gly Cys Val Cys Lys Ser Val Arg Ala Val Ile Ser Leu Pro Ala Lys
65   70   75   80
Cys Asn Leu Pro Ala Leu Thr Cys Ser Gly Ser Arg
            85   90

<210> 75
<211> 92
<212> PRT
<213> Pinus radiata

<400> 75
Met Ala Ala Pro Arg Ser Ser Ala Lys Leu Gly Ala Leu Leu Ala Ile
1   5   10   15
Leu Leu Ile Val Ala Ala Ala Gln Ala Gln Asp Cys Ser Asn Ala Met
            20   25   30
Asp Lys Leu Ala Pro Cys Thr Ser Ala Val Gly Leu Ser Ser Asn Gly
        35   40   45
Val Lys Pro Ser Ser Glu Cys Cys Asp Ala Leu Lys Gly Thr Ser Thr
    50   55   60
Gly Cys Val Cys Lys Ser Val Arg Ala Val Ile Ser Leu Pro Ala Lys
65   70   75   80
Cys Asn Leu Pro Ala Ile Thr Cys Ser Gly Ser Arg
            85   90

<210> 76
<211> 125
<212> PRT
<213> Eucalyptus grandis

<400> 76
Met Ala Asp Arg Met Leu Thr Arg Ser His Ser Leu Arg Glu Arg Leu
1   5   10   15
Asp Glu Thr Leu Ser Ala His Arg Asn Asp Ile Val Ala Phe Leu Ser

```
                  20                      25                      30
Arg Val Glu Ala Lys Gly Lys Gly Ile Leu Gln Arg His Gln Ile Phe
         35                      40                      45
Ala Glu Phe Glu Ala Ile Ser Glu Glu Ser Arg Ala Lys Leu Leu Asp
     50                      55                      60
Gly Ala Phe Gly Glu Val Leu Lys Ser Thr Gln Glu Ala Ile Val Ser
65                      70                      75                      80
Pro Pro Trp Val Ala Leu Ala Val Arg Pro Arg Pro Gly Val Trp Glu
                 85                      90                      95
His Ile Arg Val Asn Val His Ala Leu Val Leu Glu Gln Leu Glu Val
                 100                     105                     110
Ala Glu Tyr Leu His Phe Lys Glu Glu Leu Ala Asp Gly
             115                     120                     125
```

<210> 77
<211> 805
<212> PRT
<213> Eucalyptus grandis

<400> 77
```
Met Ala Asp Arg Met Leu Thr Arg Ser His Ser Leu Arg Glu Arg Leu
 1               5                      10                      15
Asp Glu Thr Leu Ser Ala His Arg Asn Asp Ile Val Ala Phe Leu Ser
             20                      25                      30
Arg Val Glu Ala Lys Gly Lys Gly Ile Leu Gln Arg His Gln Ile Phe
         35                      40                      45
Ala Glu Phe Glu Ala Ile Ser Glu Glu Ser Arg Ala Lys Leu Leu Asp
     50                      55                      60
Gly Ala Phe Gly Glu Val Leu Lys Ser Thr Gln Glu Ala Ile Val Ser
65                      70                      75                      80
Pro Pro Trp Val Ala Leu Ala Val Arg Pro Arg Pro Gly Val Trp Glu
                 85                      90                      95
His Ile Arg Val Asn Val His Ala Leu Val Leu Glu Gln Leu Glu Val
                 100                     105                     110
Ala Glu Tyr Leu His Phe Lys Glu Glu Leu Ala Asp Gly Ser Leu Asn
             115                     120                     125
Gly Asn Phe Val Leu Glu Leu Asp Phe Glu Pro Phe Thr Ala Ser Phe
         130                     135                     140
Pro Arg Pro Thr Leu Ser Lys Ser Ile Gly Asn Gly Val Glu Phe Leu
145                     150                     155                     160
Asn Arg His Leu Ser Ala Lys Leu Phe His Asp Lys Glu Ser Leu His
                 165                     170                     175
Pro Leu Leu Glu Phe Leu Gln Val His Cys Tyr Lys Gly Lys Asn Met
                 180                     185                     190
Met Val Asn Ala Arg Ile Gln Asn Val Phe Ser Leu Gln His Val Leu
                 195                     200                     205
Arg Lys Ala Glu Glu Tyr Leu Thr Ser Leu Lys Pro Glu Thr Pro Tyr
             210                     215                     220
Ser Gln Phe Glu His Lys Phe Gln Glu Ile Gly Leu Glu Arg Gly Trp
225                     230                     235                     240
Gly Asp Thr Ala Glu Arg Val Leu Glu Met Ile Gln Leu Leu Leu Asp
             245                     250                     255
Leu Leu Glu Ala Pro Asp Pro Cys Thr Leu Glu Lys Phe Leu Asp Arg
             260                     265                     270
Val Pro Met Val Phe Asn Val Val Ile Met Ser Pro His Gly Tyr Phe
             275                     280                     285
Ala Gln Asp Asp Val Leu Gly Tyr Pro Asp Thr Gly Gly Gln Val Val
             290                     295                     300
Tyr Ile Leu Asp Gln Val Arg Ala Leu Glu Glu Met Leu His Arg
305                     310                     315                     320
Ile Lys Gln Gln Gly Leu Asp Ile Thr Pro Arg Ile Leu Ile Ile Thr
                 325                     330                     335
Arg Leu Leu Pro Asp Ala Val Gly Thr Thr Cys Gly Gln Arg Leu Glu
```
                              Page 27

```
                340                      345                      350
Lys Val Phe Gly Thr Glu Tyr Ser His Ile Leu Arg Val Pro Phe Arg
            355                      360                      365
Asn Glu Lys Gly Val Val Arg Lys Trp Ile Ser Arg Phe Glu Val Trp
        370                      375                      380
Pro Tyr Leu Glu Arg Tyr Thr Glu Asp Val Ala Ser Glu Leu Ala Gly
385                      390                      395                      400
Glu Leu Gln Gly Lys Pro Asp Leu Ile Ile Gly Asn Tyr Ser Asp Gly
                405                      410                      415
Asn Ile Val Ala Ser Leu Leu Ala His Lys Leu Gly Val Thr Gln Cys
                420                      425                      430
Thr Ile Ala His Ala Leu Glu Lys Thr Lys Tyr Pro Glu Ser Asp Ile
            435                      440                      445
Tyr Trp Lys Lys Phe Glu Glu Lys Tyr His Phe Ser Cys Gln Phe Thr
        450                      455                      460
Ala Asp Leu Ile Ala Met Asn His Thr Asp Phe Ile Ile Thr Ser Thr
465                      470                      475                      480
Phe Gln Glu Ile Ala Gly Ser Lys Asp Thr Val Gly Gln Tyr Glu Ser
                485                      490                      495
His Met Asn Phe Thr Leu Pro Gly Leu Tyr Arg Val Val His Gly Ile
            500                      505                      510
Asp Val Phe Asp Pro Lys Phe Asn Ile Val Ser Pro Gly Ala Asp Met
            515                      520                      525
Ser Ile Tyr Phe Ala Tyr Thr Glu Gln Glu Arg Arg Leu Lys Ser Phe
        530                      535                      540
His Pro Glu Ile Glu Glu Leu Leu Phe Ser Asp Val Glu Asn Lys Glu
545                      550                      555                      560
His Leu Cys Val Leu Lys Asp Lys Lys Lys Pro Ile Ile Phe Thr Met
            565                      570                      575
Ala Arg Leu Asp Arg Val Lys Asn Leu Thr Gly Leu Val Glu Trp Tyr
            580                      585                      590
Gly Lys Asn Ser Lys Leu Arg Glu Leu Ala Asn Leu Val Val Val Gly
        595                      600                      605
Gly Asp Arg Arg Lys Asp Ser Lys Asp Leu Glu Glu Gln Ser Glu Met
    610                      615                      620
Lys Lys Met Tyr Asp Leu Ile Glu Lys Tyr Lys Leu Asn Gly Gln Phe
625                      630                      635                      640
Arg Trp Ile Ser Ser Gln Met Asn Arg Val Arg Asn Gly Glu Leu Tyr
                645                      650                      655
Arg Tyr Ile Cys Asp Thr Lys Gly Val Phe Val Gln Pro Ala Ile Tyr
            660                      665                      670
Glu Ala Phe Gly Leu Thr Val Val Glu Ala Met Thr Cys Gly Leu Pro
            675                      680                        685
Thr Phe Ala Thr Cys Asn Gly Gly Pro Ala Glu Ile Ile Val His Gly
        690                      695                      700
Lys Ser Gly Tyr His Ile Asp Pro Tyr His Gly Asp Gln Ala Ala Glu
705                      710                      715                      720
Leu Leu Val Asp Phe Phe Asn Lys Cys Lys Ile Asp Gln Ser His Trp
                725                      730                      735
Asp Glu Ile Ser Lys Gly Ala Met Gln Arg Ile Glu Glu Lys Tyr Thr
            740                      745                      750
Trp Lys Ile Tyr Ser Glu Arg Leu Leu Asn Leu Thr Ala Val Tyr Gly
        755                      760                      765
Phe Trp Lys His Val Thr Asn Leu Asp Arg Arg Glu Ser Arg Arg Tyr
    770                      775                      780
Leu Glu Met Phe Tyr Ala Leu Lys Tyr Arg Pro Leu Ala Gln Ser Val
785                      790                      795                      800
Pro Pro Ala Val Glu
                805
```

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<210> 78
<211> 264
<212> PRT
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<213> Eucalyptus grandis

<400> 78

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Met Gly Ser Thr Gly Ser Glu Thr Gln Met Thr Pro Thr Gln Val Ser
1               5                   10                  15
Asp Glu Glu Ala Asn Leu Phe Ala Met Gln Leu Ala Ser Ala Ser Val
            20                  25                  30
Leu Pro Met Val Leu Lys Ala Ala Ile Glu Leu Asp Leu Leu Glu Ile
        35                  40                  45
Met Ala Lys Ala Gly Pro Gly Ala Phe Leu Ser Pro Gly Glu Val Ala
    50                  55                  60
Ala Gln Leu Pro Thr Gln Asn Pro Glu Ala Pro Val Met Leu Asp Arg
65                  70                  75                  80
Ile Phe Arg Leu Leu Ala Ser Tyr Ser Val Leu Thr Cys Thr Leu Arg
            85                  90                  95
Asp Leu Pro Asp Gly Lys Val Glu Arg Leu Tyr Gly Leu Ala Pro Val
            100                 105                 110
Cys Lys Phe Leu Val Lys Asn Glu Asp Gly Val Ser Ile Ala Ala Leu
        115                 120                 125
Asn Leu Met Asn Gln Asp Lys Ile Leu Met Glu Ser Trp Tyr Tyr Leu
    130                 135                 140
Lys Asp Ala Val Leu Glu Gly Gly Ile Pro Phe Asn Lys Ala Tyr Gly
145                 150                 155                 160
Met Thr Ala Phe Glu Tyr His Gly Thr Asp Pro Arg Phe Asn Lys Ile
            165                 170                 175
Phe Asn Arg Gly Met Ser Asp His Ser Thr Ile Thr Met Lys Lys Ile
            180                 185                 190
Leu Glu Thr Tyr Lys Gly Phe Glu Gly Leu Glu Thr Val Val Asp Val
        195                 200                 205
Gly Gly Gly Thr Gly Ala Val Leu Ser Met Ile Val Ala Lys Tyr Pro
    210                 215                 220
Ser Met Lys Gly Ile Asn Phe Asp Arg Pro Asn Gly Leu Lys Thr Pro
225                 230                 235                 240
His Pro Phe Leu Val Ser Ser Thr Ser Glu Ala Thr Cys Ser Ser Ala
            245                 250                 255
Phe Gln Arg Glu Met Pro Phe Ser
            260
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<210> 79
<211> 136
<212> PRT
<213> Eucalyptus grandis

<400> 79

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Met Gly Lys Glu Lys Ile His Ile Ser Ile Val Val Ile Gly His Val
1               5                   10                  15
Asp Ser Gly Lys Ser Thr Thr Thr Gly His Leu Ile Tyr Lys Leu Gly
            20                  25                  30
Gly Ile Asp Lys Arg Val Ile Glu Arg Phe Glu Lys Glu Ala Ala Glu
        35                  40                  45
Met Asn Lys Arg Ser Phe Lys Tyr Ala Trp Val Leu Asp Lys Leu Lys
    50                  55                  60
Ala Glu Arg Glu Arg Gly Ile Thr Ile Asp Ile Ala Leu Trp Lys Phe
65                  70                  75                  80
Glu Thr Thr Lys Tyr Tyr Cys Thr Val Ile Asp Ala Pro Gly His Arg
            85                  90                  95
Asp Phe Ile Lys Asn Met Ile Thr Gly Thr Ser Gln Ala Asp Cys Ala
            100                 105                 110
Val Leu Ile Ile Asp Ser Thr Thr Gly Gly Phe Glu Ala Gly Ile Ser
        115                 120                 125
Lys Asp Gly Gln Thr Arg Glu His
    130                 135
```

<210> 80
<211> 229
<212> PRT
<213> Eucalyptus grandis

<400> 80
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Met Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu Glu
1               5                   10                  15
Val Glu Ser Ser Asp Thr Ile Asp Asn Val Lys Ala Lys Ile Gln Asp
            20                  25                  30
Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly Lys
        35                  40                  45
Gln Leu Glu Asp Gly Arg Thr Leu Ala Asp Tyr Asn Ile Gln Lys Glu
    50                  55                  60
Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly Met Gln Ile Phe
65                  70                  75                  80
Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu Glu Val Glu Ser Ser
                85                  90                  95
Asp Thr Ile Asp Asn Val Lys Ala Lys Ile Gln Asp Lys Glu Gly Ile
                100                 105                 110
Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly Lys Gln Leu Glu Asp
            115                 120                 125
Gly Arg Thr Leu Ala Asp Tyr Asn Ile Gln Lys Glu Ser Thr Leu His
    130                 135                 140
Leu Val Leu Arg Leu Arg Gly Gly Met Gln Ile Phe Val Lys Thr Leu
145                 150                 155                 160
Thr Gly Lys Thr Ile Thr Leu Glu Val Glu Ser Ser Asp Thr Ile Asp
                165                 170                 175
Asn Val Lys Ala Lys Ile Gln Asp Lys Glu Gly Ile Pro Pro Asp Gln
                180                 185                 190
Gln Arg Leu Ile Phe Ala Gly Lys Gln Leu Glu Asp Gly Arg Thr Leu
        195                 200                 205
Ala Asp Tyr Asn Ile Gln Lys Glu Ser Thr Leu His Leu Val Leu Arg
    210                 215                 220
Leu Arg Gly Gly Phe
225
```

<210> 81
<211> 345
<212> DNA
<213> Eucalyptus grandis

<400> 81
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taataaatga tgaatttatt ataaacgtat ccgtttgaga tttttgtggg tcataggtgt      60
atcaatttga aatctttgat agtaacaaaa ataattttag gtagtttatg ttttttcatga    120
tataaacctt gaaagttaat gctactaaat tgttatatat atattaggca aattacaacc     180
ttaatgcaac agttaatgac gtgatactgt tcagattata gatacaatgg ttatccttga     240
atgaataaga agaagtccta agggcaagtg ctatgagctt gcacgactgc ttttgcgcca     300
tttttgttta ccagcccggg ccgtcgacca cgcgtgccct atagt                    345
```

<210> 82
<211> 72
<212> DNA
<213> Eucalyptus grandis

<400> 82
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cagtagggga cttgttcccc caagggcacg tgtcgttggt gaagctctgg cggtggatga      60
accgcgtggg cc                                                          72
```

<210> 83
<211> 544
<212> DNA
<213> Eucalyptus grandis

<400> 83
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actagtgatt tcgtcgtctt cgtcttcttc gtcttctgga acttcgttgc tccgagcttt    60
atcagaaccg gcgatggaaa tgaaaccctc gttctctctc cctcgctcct ctctttcttc   120
tatccaggag cgtttgtaca ctgggagtac agagcttctt gcgataccga aactacccttt  180
ggacgactgg cctttttgcc tcgcgcccccc tctctgagcc ggggcgcaat ttgtcccttt   240
cccagagcga agtgtcgatt ttgtccttcc acgaggcttt acctactccc atcgcccgag   300
ccccaagccc aggcccaaat gcctgttcct tgtggccctg ccaacattcc ctttgaaatt    360
aaaaaattaa aaaaaaactc tctgccaggc aaaagtaaag attaacacca ccaaaattta   420
taacaaattt atcattcatt aattttcgtt aaattttatt ttcaaattac tgagtcgaat   480
tacatgtata aattcacgga tgtatcggtt cgagatttta tcctctaatt atcattagtg   540
tatg                                                                544
```

<210> 84
<211> 515
<212> DNA
<213> Eucalyptus grandis

<400> 84
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gattactata gggcacgcgt ggtcgacggc ccgggctggt ctgccttcct ttaactcccc    60
tttttttgtaa cttttttaaaa tgtagtttta aatttaattt aattacttt tatattaatt   120
atttaccaca tcagagacaa aacaatgtct tttttgtatt ttctagtcac gtcaacatgc   180
aaaacaacgc cattttgcac tcaccttgcc ggaaaattgc cacgtcaaca atttggctag   240
agtggcgctt aagtgatcta ttttgctcca attttggcac ttaagtgtca ttttcctaaa   300
ttttagcact taaagtattc ctctatgtca agttttgaca cttggggtgt actttgtcca   360
atcataaacc gtataagttc actttaaaca aaaatggcgc aaaagcagtc gtgcaagctc   420
atagcacttg cccttaggac ttcttcttat tcattcaagg ataaccattg tatctataat   480
ctgaacagta tcacgtcatt aactgttgca ttaag                              515
```

<210> 85
<211> 515
<212> DNA
<213> Eucalyptus grandis

<400> 85
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actagtgatt tcgtcgtctt cgtcttcttc gtcttctgga acttcgttgc tccgagcttt    60
atcagaaccg gcgatggaaa tgaaaccctc gttctctctc cctcgctcct ctctttcttc   120
tatccaggag cgtttgtaca ctgggagtac agagcttctt gcgataccga aactacccttt  180
ggacgactgg cctttttgcc tcgtgccccc tctctgagcc ggggcgcaat ttgtcccttt    240
cccagagcga agtgtcgatt ttgtccttcc acgaggcttt acctactccc atcgcccgag   300
ccccaagccc aggcccaaat gcctgttcct tgtggccctg ccaacattcc ctttgaaatt    360
aaaaaattaa aaaaaaactc tctgccaggc aaaagtaaag attaacacca ccaaaattta   420
taacaaattt atcattcatt aattttcgtt aaattttatt ttcaaattac tgagtcgaat   480
tacatgtata aattcacgga tgtatcggtt cgaga                              515
```

<210> 86
<211> 782
<212> DNA
<213> Eucalyptus grandis

<400> 86
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gagggtttca tttccatcgc cggttctgat aaagctcgga gcaacgaagt tccagaagac    60
gaagaagacg aagacgacga cggcgacatg ccttgcttga acatctccac caacgtcagc   120
ctcgacggcc tcgacacctc cgccattctc tccgagacca cctccggcgt cgccaagctc   180
atcggcaagc ccgaggccta tgtgatgatt gtgttgaagg ggtcagtccc catggctttt    240
ggtgggactg agcaacctgc tgcctatggc gagttggtgt caatcggcgg tttgaacccc   300
gatgtgaaca agaagctgag tgctgcaatt gcttcaatcc tcgaaaccaa gctgtccatc   360
cccaagtcgc ggttcttcct gaaattttat gataccaagg gttccttctt tggatggaat   420
ggatccacct tctgagctgt tggtcgcatt ctcctcagtg tttaccatgt atttcggccc   480
taaactctac ttctaggcct gttaaaagtg tctttttttaa ggtaattctg ctattacccc   540
tcttaagtgc atcttatcag taaacatgga atatcctgaa ctttgattat atgccggctc   600
gtggctgtgg aagcacttct ttatgttacc accagcttct caggtgaata taagctttgc    660
ccagtctgtt ctctggggga tttgcttggt gggtagtggc aatcagatgg ttttgtcact    720
```

```
tttgtgcata tttaagtagt aaatgtccac gacagcccaa agagtagcaa tccgggtgca      780
ct                                                                     782
```

<210> 87
<211> 115
<212> PRT
<213> Eucalyptus grandis

<400> 87

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Met Pro Cys Leu Asn Ile Ser Thr Asn Val Ser Leu Asp Gly Leu Asp
 1               5                  10                  15
Thr Ser Ala Ile Leu Ser Glu Thr Thr Ser Gly Val Ala Lys Leu Ile
            20                  25                  30
Gly Lys Pro Glu Ala Tyr Val Met Ile Val Leu Lys Gly Ser Val Pro
        35                  40                  45
Met Ala Phe Gly Gly Thr Glu Gln Pro Ala Ala Tyr Gly Glu Leu Val
    50                  55                  60
Ser Ile Gly Gly Leu Asn Pro Asp Val Asn Lys Lys Leu Ser Ala Ala
65                  70                  75                  80
Ile Ala Ser Ile Leu Glu Thr Lys Leu Ser Ile Pro Lys Ser Arg Phe
                85                  90                  95
Phe Leu Lys Phe Tyr Asp Thr Lys Gly Ser Phe Phe Gly Trp Asn Gly
            100                 105                 110
Ser Thr Phe
        115
```

<210> 88
<211> 1521
<212> DNA
<213> Pinus radiata

<400> 88

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ccttcaaaga caacagagaa agttatgcaa tatgctggca gctagctctt gggataatct    60
atttagcgat gggtttgtcg agaagttggg agcatttatt gtgaagcttc acagaaaaaa   120
tgtcgaatac atcaagcaca tgaagaagca atttgtgcca taggctatct ttagcctcat   180
ggatgttaaa ataatttctt tctttccttc cttcttcttt cttacccacc aaaacacaaa   240
ataatagttt caaattttga attttcaccc aattttatga gaggacaaaa ttacttagag   300
tctttcactc tttaatttat attctacata agtacctaaa gaggctctcc gacaatcata   360
tgataccata aaagtaacct cgattagaga gcgcctctcc atacaatcat ttgattttcg   420
agttaaatca aaattatagg ctatttccaa atcaatctat cgtccaactg aaaatttcaa   480
atgaatggaa ccagcacgga gtttcgtagg aaatagaagt aataggtgaa aagaagcatt   540
gtcgaatttg aaagaatacc ctacgttttc atttcaaaaa ccatggtttt ttgtaagagg   600
gattaagttg actcaaggtt gtagaaggtt gacataacaa tagcatgcag gcacaggatg   660
catgtagtgc ccgtaatttg gaccaaccta gtaagattgt cacccgtttc aaatgactgc   720
ctacaagtgc atgcaaaggc catggaagtt gatggttagt gaaaagatcc ggagagacga   780
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caaatccatt acgcccaccg ggcccggccc tgctcacaca tcttgcatcg cccaactact  1020
ctgattttac atgaatatca atactattcc ctccacttat aaaatggcca aacgccctgc  1080
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aatttgatcg agaaggatgt ctgcatcgaa cggaactaat ggtgttgtcg cagtcaagtc  1200
tcgccgacag cacagacctg ggaaaacgac agccatggcg ttcgggaggg cgtttccaga  1260
tcagctggtg atgcaggagt tcctcgtcga tggatatttc cgcaacacga attgccagga  1320
ccccgtcctc cgccagaagc tcgaaaggct ttgcaagacg acgacggtga agacgcgata  1380
cgtggtgatg tcggatgaaa tattggcgca gcatcctgag ctggcagtgg aaggttcggc  1440
caccgtccga cagcgactcg agatctcgaa cgtggccgtg accgacatgg cggtggacgc  1500
gtgccgtgac tgcctcaaag a                                            1521
```

<210> 89
<211> 2590
<212> DNA
<213> Eucalyptus grandis

<400> 89

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tatgtaaaag cgcgatcaat ttattgaccc cgacgacctt gactccatac ttcacgcctc     120
agctttgtgt tggatggtct tgacctctct caccctaaaa ggtagctcaa aagaatgaga     180
ctttccgtca tacttataaa ccgaccacca gcctctttca caaccgacat gggacaacct     240
caaatagaat ttttaacaac acccttgcac gctctttcta tccactttat tatgccatca     300
catgagcgtt ttccacgcgt aaatcggcta ccacccactt tcacacggcg gcgaaacgag     360
aaaaaggtcc tacctttgac tccccccgcg tcccaaattc tcactcccga ccggtaaccg     420
agctcacaag tttcagcctt tcatcatcat cactcgaagg cagagagaag gacatacact     480
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acacatcccg cggagcaacc cgacgtccca aactcttcgc tgatcaaaac cagtccggtc     600
gactccgttt cgcgcggacg caacgtgaga gagggagaga gagagagaga gtaccggcga     660
ggggatgatg ctgtgcggaa gcgtcgtcgg gcgctctccc ggcgaacgcg tctctacatt     720
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ggaagctcac ggcattttc agagagagag agagagatgg cacgtcagag cgccattccc     840
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gacaaaaaaa aaaagaaaat aaagacggtc acccaaatta tttcttataa cacaaaaaat     960
cgtacctata taatatatct atcactaact tgtgcagtat gacaaattta cacatttacc    1020
tgaaactgtt tttataacat aaaaaattta aacatttttc tgtgacaata aatgttcaca    1080
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tacaaattta tgatttttcg tgttggcaag aaagtttgag ataaatgtat cattgtaggt    1200
aaagtttaga gttttttttt atggctttta accaaaatgc acattttagt tccgagttct    1260
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gcggacctgg cgagaatgtg gctactttaa tgatgaggat ttgagatatt ataccacgat    1620
ccataataat aaaggagcgc ggcaatcata tctttttca tataaaggac gatttatttt    1680
ctatgctgtg agtatttgct cttggaatta taagatatta gagatcaaac ctatcaccaa    1740
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ctttcattgt gcacttgaat atttaaacat aaattattag tagtagataa tttttttaatt    1860
taactaataa tgagcactca ttttttagaaa aatagttttc aaatcattca ttttctactt    1920
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caacacggaa tgaatcctaa cgcacttgga aaacaatcaa tccacgctac gcaagctaat    2160
gctcacacaa gcatcatgat acccgaagcc gaaaatacat gagtcgaaag acatcgaact    2220
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agccttccag tacctgctgt ttaaatgctt tgtcaatgtg attcgaatcc tttcaaagat    2340
cctgaaagtg cagcttcaaa aatggcgtcg accaaatgcg cttgcgttgc tgcaatctcg    2400
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tggcaagagg ccggtgagcc gacggatctg gacttacgtg gaggaattgc cggaaccctg    2520
gggtcatcaa gtgagggcgg caccatggcc agctccgaca tgggcggttt tggccaggac    2580
atgcctggtg                                                           2590
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<210> 90
<211> 1172
<212> DNA
<213> Eucalyptus grandis

<400> 90

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aaaggttgcc gaaggtccgg tgacctcagc tgacggccac ctacaccaaa tctagctcac     180
tagcagccta agcccttcat caactctagt gaaaggtttt gagtattttt taataaaaaa     240
tatttaaaaa atatatagcg agagctcatt acaaaaaaat tttaaaaaaa aatctaaaca     300
ttacttgaac tcaaagtgac tttataaaga gttttaccaa aaggatcttg gtttcatcat     360
ttgcactaca cccaaaaccc aatttctaag ttaaatcaaa cccactgtct aatagagata     420
aggtaaatgt tataaaccaa attccaaaat tccgaagcac taaatatatt tgctgatctt     480
ataatcgcca attgagaggg tctcattctc caaggggattg tgacatatta gtaattgata    540
gggtctcatc cgtaggactc cgactcagcc gcgccacgtg actggatcgc tgaacggcgc     600
```

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ggaaccagag gagcgtgatt acctaatatt ttctcctacc ttggccttga gattgaattt      660
cagaaaaaga aaagaaaaa ggaacaactt cgccgactgt tctataaaat gcatgcgcca      720
ccccgacccc cacccacgca tcacatccat ccagcctcca cgacagacgc ataaacacaa      780
cacacgtcgg ttagagagag agagagagag agagagagat gcttggacag      840
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aagtacacaa aggtggacca cgagcgccgc gtgaaagaaa cggaggcgat cgaaggtggg      1080
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<210> 91
<211> 446
<212> DNA
<213> Eucalyptus grandis

<400> 91
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tggtacactg aaacaacagg aaggtggtgg aggccgcaat gatggaattt atccacttta      120
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<210> 92
<211> 2119
<212> DNA
<213> Pinus radiata

<400> 92
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gattgatgag ttccagtgga gtctgccatt ttatttcttt ctctctttca ttctttgcaa      420
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<210> 93
<211> 2571
<212> DNA
<213> Eucalyptus grandis

<400> 93
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<210> 94
<211> 1406
<212> DNA
<213> Pinus radiata

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<210> 95
<211> 2546
<212> DNA
<213> Pinus radiata

<400> 95

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<211> 4726
<212> DNA
<213> Pinus radiata
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tcagtcatgt atgtgagcaa ttagccaaac taggtcctaa ggttcaacca gtgcagacaa      4200
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ctttacaata gtgtgtttat aaagctaatc aaatgcttct atttaaatat atagcaacct      4560
acacaagaaa ttcactagga cagcaatcac ttggccaatg tgattaccaa tataaccata      4620
cttgaagagc atacataaat cacaaataat gattcaatta gaaatatctt aaagataaac      4680
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<210> 97
<211> 635
<212> DNA
<213> Pinus radiata

<400> 97
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aataaccgag ggttttttcaa accaaggtta agcctctcat cattggggtg tgtatgaaaa      180
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gtgggataca gctactttac aactgtaaat ttgttgaggc agcctatcct cagcctatac      540
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<210> 98
<211> 468
<212> DNA
<213> Pinus radiata

<400> 98
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tttcttattt tttttatgaa ccgtcggatt cgagatcgga cggcgatccg aaactgcaag      180
```
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```
cgtcggccgt cggatgcagc atcggacggc aaagaaggaa ccctaaaacg cattgcaacg      240
tgcttggtgg gtggagggtc tatggccagt atatgttgat aacaagggag aggaagtagt      300
cctcttcatc tagtgcgagt ctctctgctt ttctacgccg ctgcgaagct gttctgtggt      360
gtttctgatt ctccagactc aggcagtcgt ttttgtaaga gaatttagtt catcatggga      420
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```
<210> 99
<211> 222
<212> DNA
<213> Pinus radiata
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<400> 99
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cgtcggccgt cggatgcagc atcggacggc aaagaaggaa ccctaaaacg cattgcaacg     180
tgcttggtgg gtggagggtc tatggccaga tatgttgtaa tc                        222
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```
<210> 100
<211> 597
<212> DNA
<213> Pinus radiata
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tattgcttcg actcatatcc cccaaagagt ggatccagct ctaatagctc caaatcgatt     180
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```
<210> 101
<211> 669
<212> DNA
<213> Pinus radiata
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<400> 101
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gtatcgtata aaataaatct tttgctccac acactttgga aaatacattt tcaacaatgc     180
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ccgattggga tcactagtcc atcactcatg gtctgcattg cctttaaatt ggcggggcga     360
ggaaagacca atgcgtcatt ggtgtagacg agctctatta gctcaggcct ctctgctgct     420
ccttggattg caatctcatt ctctgatttg ccgtgctgtt tgctctgctc acttcagccc     480
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gtgaccagat ttctgatgca gtgttggatg catgcctcac ccaggacccc gacagcaagg     600
tagcatgcga gacttgcact aaaacgaaca tggtcatggt ttttggtgaa atcaccacca     660
aggccgatg                                                             669
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```
<210> 102
<211> 230
<212> DNA
<213> Pinus radiata
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<400> 102
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tggtagcatt agcgattccc ttcaccaaat gaaccctttg ctggtgatga gtggacaacc     180
taaagttgtt tgctggtgat gagtggacaa ccagagtggg ggttggggaa                 230
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```
<210> 103
<211> 596
<212> DNA
<213> Eucalyptus grandis

<400> 103
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gtcgtcggcg ccttcttctt tacagattgt atcctcccat taaccgcgtg gacctgcact     180
gtaaccccga aacggtgggg gccaatttcg tctttccgcc tcctccactc agcttcgtgg     240
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catttcaact ctccctctct ccctctcttc tgcccctcga tcgatccagc gatcttccta     540
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<210> 104
<211> 653
<212> DNA
<213> Eucalyptus grandis

<400> 104
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tcggcgaccc tcaccaatgc tggggcgagg gtgagcaacc ctcatccaaa tctggagagg     180
gttgtcactc gagaaagggt cactggccct cccctaaccg ctactaacat cgttggcctt     240
cgtcaccacc gcactaacaa tgggccacta attttatatt tttcgtgata ttaatcctat     300
taaaaatgaa aatatctcct taattaatta agcttgtcag gaccgatgta aacaaaatta     360
atgtaaatgg acgcgccttt gacttgccaa caaactcgaa acgacgtttc ctccgtctga     420
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acctcaccgc ctagagagag aaagagagaa agagggaaga gagagagaga gag           653

<210> 105
<211> 342
<212> DNA
<213> Eucalyptus grandis

<400> 105
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ataggataga attatcttct gtcttgatgg tttccatgag aaccaactgc tatactatga     120
aaaatatcaa tgttccacaa tattttgggg acaagggaac acaagattga gtcaacagtt     180
caggacccca gaaaaattat tcctgagttc gcagattatt ttcctaaaag tgaacaattc     240
aagaccctag ccaaatcatt cccaagtcca agttatgtga cactgcgact aacaaggcaa     300
gttggaagaa accatcaatc aatctcctag ttaatgacag tc                       342

<210> 106
<211> 342
<212> DNA
<213> Eucalyptus grandis

<400> 106
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acgagggtcg aatttatagt gggcgaagga tgattaggtg gaatatgaca agaaaatagg     180
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<210> 107
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<211> 948
<212> DNA
<213> Eucalyptus grandis

<400> 107
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aaattcgcac aaccaaagtt gctatgcaga agtcaactca atcctaatca agttgatgag   180
agtgttgggc cctattttct gcagcaaaca tgaatctcga ttcatctccc tcgcaaaaga   240
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<210> 108
<211> 362
<212> DNA
<213> Eucalyptus grandis

<400> 108
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ccccgaccta attccggttg tctctgatta catcaattct tatgtcttaa cactccattc   180
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aaacacttgc tcagacacca tcaaatcctt cgcaaagtct ttttcttaca aaaaacaaac   300
gaaagcaacc atgaagcacc agttcattgt tctggctctc ttattcctca tcaacacagc   360
cc   362

<210> 109
<211> 326
<212> DNA
<213> Eucalyptus grandis

<400> 109
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gttgcatcca tgattgttga cttcactttt tgtcgattcc ttcaagctgc tgattcttca   240
agttgccaat aatttttattc ataaatgacg aaactctagc ctcatccatt aagtttgtta   300
cttgtccaca ataattaaat tcggta   326

<210> 110
<211> 296
<212> DNA
<213> Pinus radiata

<400> 110
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aattacaaca aaaactcaca gcatttgaag gaagttggag tggtagagtg agaaatacac   180
agcctaatct gaaggaagtt cgagtaatag agtgagaaat ggatcttctt ctcctcatga   240
tgatgcttgt gatgatgggt gtagcaatgc ctactcattc tcaacaaatc actagt   296

<210> 111
<211> 723

<212> DNA
<213> Pinus radiata

<400> 111
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gtacagaaga ccactttctt tacgcggtca agacaccgcc attctcgggt caagtcggga     180
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<210> 112
<211> 1301
<212> DNA
<213> Pinus radiata

<400> 112
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ccttccccgt cctaccaaaa cccaaacttc ttgcccgaac tcaccttcta tgtattaatt     180
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<210> 113
<211> 3070
<212> DNA
<213> Eucalyptus grandis

<400> 113
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                                  Page 42
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aaaaaaaaaa                                                          3070
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<210> 114
<211> 1227
<212> DNA
<213> Pinus radiata

<400> 114
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agttattccc ctaatgtgga gacaattgat tagaagttct atgagaaaaa tccaatcatg    180
ttaaagtgac ccctaatgtg aagacaattg attagaaatt ctatgaaaaa aatccaatca    240
tattaaaagt ccaattgatt agcaatttta tgagaaaaat ccaattatgt taaaagtcac    300
tgagtgtggc cgaaattgtg accgaaattg aatgcaataa ccgagggttt ttcaaaccaa    360
ggttaagcct ctcatcattg gggtgtgtat gaaaatgtaa tgggcatcga taaccttta    420
ttacaacttc acgaaaattg cctctattca atgggtgtgg atgaaaatgt aagtgcgcat    480
cgataatgga aagcgatatg cagcaaaatc aataaacctg acttcccatg tgagtgatga    540
tttgatcgta caactgatgg tgtgaagtta ctttcagctt caccttcggg cataatcagg    600
gaagtagggc caagtttgct tagtatcact ctaatcccca acaccgtgat tactatcttc    660
atcaacaatg gccaccttcg tcattacttt aactggtggg atacagctac tttacaactg    720
taaatttgtt gaggcagcct atcctcagcc tatacatact aattattgca gctcgattag    780
gtatctgctg tgagaatagc tgtgtatctc tgcgctggtt gcaggatcca agttcctctc    840
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taacataaaa tttgaaacag tgcccgacgg actgcctccc caccacgatc gcagtactca     1140
gaatcttgcg gagctcttcc aatccatgga agagaacgct catattcact tccacaagtt     1200
gatggagaag ctccagaatc ttcggga                                         1227
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<210> 115
<211> 1169
<212> DNA
<213> Eucalyptus grandis

<400> 115
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aaattgagag ggagaatttt agaacaaaat cagatttgga gaatacatgc cattttaggg      180
ggattttggg gatttcgcat atggcgtcgc gtcgtcggcg ccttcttctt tacagattgt      240
atcctcccat taaccgcgtg gacctgcata gggcacgcgt ggtcgacggc ccgggctggt      300
ttcattatat gattattacg tcataatgat cgatttctag aaatttggag acatatgtaa      360
attcaggagg aatttcaaga aacgcgcgtt actttgaaag ggtctcgagt caaagtgctc      420
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<210> 116
<211> 947
<212> DNA
<213> Eucalyptus grandis

<400> 116
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acgagggtcg aatttatagt gggcgaagga tgattaggtg gaatatgaca agaaaatagg      180
tttgaaagag aaataaatat tatgatagtg aagggtcttc acatggttag tttgatctgt      240
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gtagccaaag taagaatttt cctttcactg tccggacatt tcgattgcta catggaccat      360
cccgtgtcta cccattcttg agaaccttcg agtggaaagc atgaataacc caccttgtac      420
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<210> 117
<211> 1766
<212> DNA
<213> Eucalyptus grandis

<400> 117

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<210> 118
<211> 1928
<212> DNA
<213> Eucalyptus grandis

<400> 118

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gttacgttct ccatggaaac tcgaaaggat aaaaattaag aaacggaagc tccatgagaa     180
cgatgggggt cagcatcact cctattgtat tgtgctctca ttatctctgg cctacttgag     240
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taatcatatg gagaaatatc cctcttaagg gaagcatatg agtttttttct taggatgact     360
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<210> 119
<211> 602
<212> DNA
<213> Eucalyptus grandis

<400> 119
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tttggaggga aaaataaaaa aatagattga gacgtattct aggagaggat agcaaaagaa       420
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caattttcat acaactcttt catttaagca ccgtgacttc caaaaatcga tcatccttat       540
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<210> 120
<211> 1326
<212> DNA
<213> Pinus radiata

<400> 120
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gcccccactc acaagataat atcttttcca taatataata tatattccta ttgaagcagt       180
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<210> 121
<400> 121
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<210> 122
<400> 122

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<210> 124
<400> 124
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<210> 125
<211> 1489
<212> DNA
<213> Eucalyptus grandis

<400> 125
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gattaccgac agtgatttca taagcacagg aaagactacc tatgttgaca atatcgaggg    1440
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<210> 126
<211> 1273
<212> DNA
<213> Eucalyptus grandis

<400> 126
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<210> 127
<211> 3720
<212> DNA
<213> Eucalyptus grandis

<400> 127
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tggcactagt cccacaattc aatcattcta tttccattct ctgtaaatgt accctattca    180
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caacattgac agcaaatgca cgcactttcg ataaagttca gacagtataa taagttctca    300
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<213> Eucalyptus grandis

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<210> 129
<211> 25
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<213> Eucalyptus grandis

<400> 129
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<210> 130
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<213> Eucalyptus grandis

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Page 49
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acagaatgtg taacgaaacg gcgtatatgg atgtgcctga atgatggaaa ttgtgatatt      1920
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<212>   DNA
<213>   Eucalyptus grandis
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ttaatttaac aaatagctct tgtaccggga actccgtatt tctctcactt ccataaaccc      240
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gttggtgaac cgcaaagttc ctatatatcg aacctccacc accatacctc acttcaatcc      480
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<213>   Eucalyptus grandis
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cggaa                                                                  485
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<213>   Eucalyptus grandis
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ttttgcggga gggttggtga accgcaaagt tcctatatat cgaacctcca ccaccatacc      240
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<213>   Eucalyptus grandis
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gtcaatggca tgcgtgacga atgtacatat tggtgtaggg tccaatattt tgcgggaggg      180
ttggtgaacc gcaaagttcc tatatatcga acctccacca ccatacctca cttcaatccc      240
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<213>    Eucalyptus grandis

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<212>    DNA
<213>    Eucalyptus grandis

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<210>    137
<211>    66
<212>    DNA
<213>    Eucalyptus grandis

<400>    137
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gcggaa      66
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